DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

CIVIL WORKS PROGRAM
STRATEGIC PLAN

FY 2003 - FY 2008

Draft

September, 2002

Civil Works Program Strategic Plan

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Foreword

This strategic plan is developed at a time of pressing national challenges to protect our homeland, win the war against terrorism, and promote a robust economy. The plan is offered in the spirit of playing a key role in meeting these challenges.

The Army Corps of Engineers traces its origins back to the construction of fortifications at Bunker Hill in 1775. For more than 227 years, the Corps has responded to the Nation's and the Army's challenges. Throughout this period, the mission of the Corps has evolved from "Builder" to encompass "Developer/Manager" and "Protector" of water resources. What began as a military engineering mission for nation building in the 18th Century adapted into a major peacetime mission in the 19th Century. The Corps helped develop a vast water resources infrastructure, initiated development of the first national parks, and linked navigable waterways together to move commerce across states and keep ports and harbors open -- a role critical for national defense. In the 20th Century, the Corps' civil mission changed again with the adoption of more water resources development and management duties, including flood control, hydropower, recreation, water supply, shore protection, and disaster relief. More recently, environmental protection and restoration missions were entrusted to the Corps. As society's requirements and values have changed, the Civil Works Program has reflected changing national priorities for good water management. The Corps has the spectrum of capabilities to facilitate integrated water resources management with others and within the context of national priorities.

Responsibilities for the development, management, and protection of the Nation's water resources constitute the current Army civil works mission. One of the great strengths of the Corps is the force multiplier effect between civil and military missions. In addition to the direct contributions that the civil works missions make to our economic and environmental security and prosperity, the Corps also applies its civil works assets to support the Army in times of national need to enhance homeland security and to promote democracy abroad. In turn, the civil works program derives greater capability and effectiveness by being an integral part of the larger Army and Defense team. This capability can promote homeland security and economic vitality.

As we enter the 21st Century, the Army Civil Works Program Strategic Plan provides a framework for enhancing the sustainability of America's resources. We aim to do this by focusing on solutions and services that benefit people and the communities in which they live. This plan's strategic goals embody a vision for an Army Corps of Engineers as a national problem solver and public advisor for integrated approaches to water resources solutions and services -- considering that winning the war on terrorism is our greatest challenge.

The Honorable R. L. BROWNLEE
Acting Assistant Secretary of the Army
(Civil Works)

ROBERT B. FLOWERS
Lieutenant General, USA
Chief of Engineers

Executive Summary

For over 200 years, the Nation has called upon the U.S. Army Corps of Engineers to solve problems. As a new Century begins, many partners, stakeholders and customers are questioning whether sufficient attention has been paid to planning for future water resources requirements. The Nation must invest sufficiently and wisely in water resources development to preserve and protect our national prosperity, competitiveness, quality of life, and environmental sustainability.

A primary objective of this strategic plan is to present information about ways in which the Corps of Engineers can address the challenges that the Nation is now facing in public engineering on a national scale. Research and public involvement suggest **five national water resources challenges**:

1. Balancing water resources demands and environmental quality concerns.
2. Repairing damage to our environment from past development.
3. Addressing the performance and safety implications of an aging water resources infrastructure.
4. Ensuring the capability to respond to natural disasters and terrorism threats to existing water resources infrastructure.
5. Minimizing institutional inhibitors to achieving efficient and effective water resources decision making and management.

This strategic plan orients us toward a vision of contributing to sustainability through integrated water resources management in ways that protect, restore, and preserve environmental health; promote economic vitality; and protect and promote quality of life. We will do this by focusing on **five strategic goals**:

1. Provide sustainable development and integrated management of the Nation's water resources.
2. Repair past environmental degradation and prevent future environmental loss.
3. Ensure that operating projects perform in a manner to meet authorized purposes and evolving conditions.
4. Reduce vulnerabilities, risks, and losses to the Nation and the Army from natural and man-made disasters, including terrorism.
5. Be a world-class public engineering organization.

Achievement of the five goals will be pursued through **13 objectives** that shape performance expectations in annual performance plans.

Consultation Process

We initiated a broad-based dialogue about pressing water resources challenges through the Internet and a series of public "Listening Sessions" around the country between June and September, 2000. Information obtained from these sessions has been instrumental in our selection of goals, objectives, priorities and strategies. To help in preparing a final version of this plan for transmission to the Office of Management and Budget and Congress by March 2003, we furnished draft copies of this plan to relevant committees of Congress, including the Chairman and Ranking Members of the Senate and House Appropriations Committees and Subcommittees. Additionally, we solicited feedback from agencies, entities, and other stakeholders potentially affected by or interested in our Civil Works Program. We also solicited individual comments on the draft plan after posting it on the Internet in September, 2002.

Department of the Army
U.S. Army Corps of Engineers

Civil Works Program Strategic Plan

I. Introduction

The U.S. Army Corps of Engineers (the Corps) is the world's largest public engineering, design, and construction management agency. The Corps is an executive branch agency within the Department of Defense and an Army Major Command (MACOM). The Corps employs approximately 35,000 persons, 27,000 of whom perform civil works duties. We are organized into a headquarters and eight regional divisions or Major Subordinate Commands (MSCs) that exercise supervision and direction over 38 districts that carry out civil works missions. The Corps also has several world-renowned laboratories and other offices serving civil works missions.

This strategic plan for the Civil Works Program satisfies the requirements of the Government Performance and Results Act of 1993 (GPRA).1

Overview of the Strategic Plan

Section I of this plan highlights the Corps' civil works mission in the context of the Corp' vision and the Federal role in public engineering. **Section II** introduces a series of important national water resources challenges facing the Nation that, if not met, will likely impair our national prosperity, global competitiveness, quality of life, and environmental sustainability. Overarching strategic goals are presented in **Section III**. Strategies for achieving the goals are presented in **Section IV**. Objectives and initiatives are specified in **Section V**. Finally, **Section VI** describes our implementation plan and the procedures for evaluating and updating the strategic plan.

1 The Department of Defense (DOD) is the agency level responsible for submitting a strategic plan and annual performance plans to Congress and the President under the Government Performance and Results Act (GPRA). U.S. Army Corps of Engineers Civil Works Program submits a strategic plan in compliance with GPRA per the request of the Office of Management and Budget. The balance of the Corps of Engineers is included in the DOD plan.

The U. S. Army Corps of Engineers Vision

The United States Army Corps of Engineers serves the Army and the Nation by providing vital public engineering services and capabilities across a full spectrum of operations in peace and war in support of national interests. As public servants, we embody core Army values of loyalty, duty, respect, selfless service, honor, integrity, and personal courage in our quest to be the world's premier public engineering organization.

The U.S. Army Corps of Engineers Vision

As the world's premier public engineering organization, responding to our Nation's needs in peace and war, we will be a full-spectrum Engineer Force of high-quality, dedicated soldiers and civilians – trained and ready – a vital part of the Army – dedicated to public service – an Army values-based organization.

Our core competencies orient the U.S. Army Corps of Engineers to a full spectrum of missions:

- Create synergy between water resource development and the environment;
- Restore, manage, and enhance ecosystems, local and regional;
- Build and sustain the critical facilities for military installations and the public;
- Respond to local, national, and global disasters;
- Provide full-spectrum engineering and contingency support.

Our core competencies not only help us accomplish our public engineering missions but also complement the missions of others to achieve a sustainable future. Our agility allows us to respond quickly to wide-ranging demands throughout the world by providing engineering and related technical services. As one Corps, we provide a one-stop service to afford life-cycle public engineering and related interdisciplinary services to non-Federal partners, other agencies, and international organizations. These capabilities help us create critical synergies with others. We apply project management to all our work to enhance our team effectiveness and responsiveness. We aim to deliver the right things in the right way to produce quality results.

Our foundation is our public engineering technical expertise in planning, design, construction, and engineering management. We leverage our capabilities through attention to people, processes, and strategic communications. This expertise is augmented by demonstrated competence in contract management, contingency and disaster response, real estate management, environmental services, and engineering and materials research and development. Our full-spectrum engineering capability positions us to meet national challenges.

An Overview of the Civil Works Program

The Civil Works Program provides fundamental public engineering services to the Nation and the Army. The purpose of the Civil Works Program is to pursue responsible development, management, protection, and enhancement of the Nation's water and related land resources for the purpose of improving the public's welfare through commercial navigation, flood damage reduction, environmental restoration, and allied purposes.

Civil Works Mission

Contribute to the national welfare and serve the public by providing the Nation and the Army with quality and responsive

- **Development and management of the Nation's water resources;**
- **Protection, restoration, and management of the environment;**
- **Disaster response and recovery;**
- **Engineering and technical services**

in an environmentally sustainable, economic, and technically sound manner through partnerships.

The water resources infrastructure provided by the Corps has facilitated the development of cities and towns, the growth and production of food, the transport of goods to domestic and international markets, the protection of our homeland, the protection and restoration of our cultural and natural resources, and the swift return to normalcy from the devastation wrought by natural disasters. National benefits from this infrastructure include cost savings from

transportation improvements, reduced flood damages, available hydroelectric power, recreational opportunities and their accompanying economic benefits, and an available supply of water for homes, schools, businesses, hospitals, and farms.

The benefits of our Civil Works Program are tangible. A barge that carries 1,500 tons of cargo delivers the equivalent of 15 rail hopper-cars or 60 large semi-trucks with less adverse pollution impacts. The nearly 800,000 jobs that result from the activities of the inland waterway system generate a total payroll of $1.7 billion and over $425 million in Federal and state payroll taxes annually. U.S. ports and harbors contribute $783 billion to the Nation's Gross Domestic Product, $16 billion in jobs, $515 billion in personal income, over $150 billion in tax revenue, and $1.6 trillion in business sales each year. Flood control projects have prevented nearly $700 billion (adjusted for inflation) in riverine and coastal damages since 1928. The Corps' shore protection program has protected 241 miles of the Nation's 2,700 miles of critically eroding shoreline. The Upper Mississippi River System-Environmental Management Program has restored, protected, or enhanced over 35,000 acres for fish and wildlife. The Corps' multi-purpose hydropower projects generate 3 percent of the total electric power capacity in the United States. In 2000, agencies that market Corps hydropower have returned over $444 million to the Federal Treasury from power sales. The water stored in Corps reservoirs can serve the water requirements of about 85 million people a year. The Corps provides recreational facilities that are visited by 10 percent of the U.S. population at least once a year. Our recreation sites generate 600,000 full- and part-time jobs. The Corps jointly provides an on-line public reservation service with the USDA Forest Service for more than 45,000 sites at over 1700 Federal lakes and parks. Thousands of people have made their reservations through the web-site and toll-free telephone call center.

The Nation has invested significantly in a water resources infrastructure consisting of ports, navigation channels, canals, levees, dikes, locks, dams, reservoirs, water supply distribution systems, and aquatic habitats. This capital stock plays a vital role in encouraging a productive and competitive national economy. The U.S. Army Corps of Engineers acts in the national interest to promote economic development, interstate commerce, international trade, environmental quality, national security, economies of scale, engineering-related research and innovation, and environmental stewardship in areas where the public requires the utmost confidence and highest quality. Ensuring and maintaining public trust in our public engineering work is imperative for us.

Water is a public good, and the responsibility to design water infrastructure for the public good implies an accountability to design water resources infrastructure in ways that sustain resources for future generations.

This implies roles for the Federal government to set and maintain standards, to allocate resources, to develop plans, and to manage resources for long-lasting positive impacts. Figure 1 encapsulates appropriate Federal water resources roles. The Federal government is uniquely positioned to foster a dialogue about what should be done to manage water in support of state and local governments, but the complexity of contemporary water management requires a commitment on the part of those involved in water resources management across all levels of government to find consensus regarding the development, management, and stewardship of America's water resources.

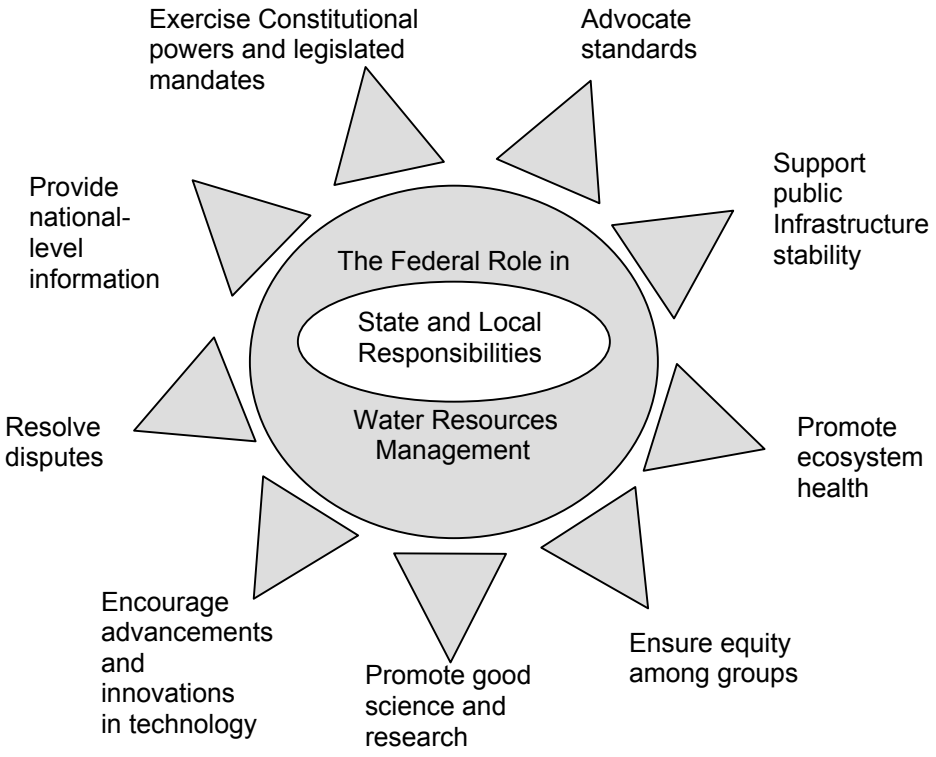

Figure 1. Federal Water Resources Roles

The Corps of Engineers is especially suited to facilitate solutions among competing claims on water, to design complex solutions, and to resolve complex technical water resources issues. The Corps' primary civil works missions span Business Programs related to 1) navigation, 2) flood and coastal storm damage reduction, 3) the environment, 4) the regulation of work by others in waters of the United States, including wetlands and the oversight of deposits of dredged and fill material in these waters; 5) and emergency management. The scope of our

responsibilities, experience, expertise, and geographic availability creates a full spectrum of capabilities—grounded in our planning, engineering, hydrologic, project management, consensus-seeking skills and tools, and the vast water resources infrastructure and associated Federal lands we manage.

The Corps has served as an instrument of the Nation's will—to develop the western U.S. by providing navigable channels for water transportation; to protect the Nation's cities and farms from the ravages of floods; and to foster regional economic development through navigation improvements and flood control**.** U.S. water policy has evolved in response to legislative mandates, increasing demands for water use, and evolving values about environmental and economic priorities. The water resources landscape has grown in complexity to reconcile conflicts over how to use common water resources.

A Commitment to a Sustainable Future

Over the past 30 years, the Nation has come to appreciate that growth and development must occur in a sustainable manner so as to protect vital ecosystems and precious native cultures and cultural artifacts for the benefit of future generations. Water infrastructure and the environment are now viewed as an integral whole. Environmental quality and economic development can and must be interdependent goals of water infrastructure design. Water resources management increasingly reflects a link among environmental, social well-being, and economic objectives. Sustainable development happens through environmental engineering. The objectives of sustainable development are to maintain and promote environmental health, economic prosperity, and social well-being. When engineering aims are combined with an environmental ethic, the result is ecological design: the deliberate design of our environment through engineering means for lasting positive effects on ecosystems. As environmentally attuned engineers, we take responsibility for the condition of the environment and natural resources through our stewardship, regulatory, project planning, engineering, construction, and operations activities.

> **Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.** ***The World Commission on Environment and Development [Brundtland Commission], 1987.***

Our **Environmental Operating Principles** will help us develop sustainable solutions to water resources problems

Table 1. U.S. Army Corps of Engineers Environmental Operating Principles

Environmental Operating Principles
Strive to achieve environmental accountability. An environment maintained in a healthy, diverse, and sustainable condition is necessary to support life.
Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances.
Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
Continue to accept responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
Seek ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.
Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the Nation's problems that also protect and enhance the environment.

These guiding principles strive for a synergy between economic and environmental impacts. They embody a systems perspective, respect natural interdependencies, integrate interdisciplinary knowledge bases, and seek mutually acceptable solutions through collaboration.

To support our search for greater balance across competing water resources demands, the Chief of Engineers reactivated his Environmental Advisory Board (EAB) in 2001. The EAB advises the Chief about policies and procedures for achieving sustainable engineering and economic development. In addition, the Corps is working to integrate environmental values into all business functions through the Army's Environmental Management System. The Corps is also defining ecosystem restoration benefits.

In preparing this plan, we consulted with our customers and stakeholders.

We work with customers and stakeholders in the quest to balance economic, environmental, and social goals. Many of these entities also are full *partners*, including cost-sharing sponsors, other governmental entities for which we do reimbursable work, and sister Federal agencies who share our goals. Our most important *customers* are the American taxpayers who endow our programs. They are the ultimate beneficiaries of the results we deliver. Through the President and Congress, taxpayers decide which products the Corps provides and desired levels of project services. Project beneficiaries—local communities, navigation interests, recreational users, drainage districts, and other interests—are also customers. Those affected by our services—for example, applicants for wetlands development permits—are also counted as customers. Our *stakeholders* include those who provide oversight for our mission accomplishment, such as Congress, higher headquarters organizations, other Federal agencies (e.g., the Office of Management and Budget, the Environmental Protection Agency), and state and local agencies. Our stakeholders also include non-governmental organizations (e.g., environmental and taxpayer organizations, industry associations), local sponsors (e.g., local governments, port authorities, levee boards, state governments), and performance organizations (e.g., architectural and engineering construction companies, and environmental contractors) that work in partnership with us to deliver our products and services to our customers.

II. Charting a Strategic Direction
Water Resources Challenges for the Future

This section presents key inputs that helped us focus our strategic priorities for the Civil Works Program. Three inputs are discussed: 1) general trends and assumptions about the future environment; 2) a preliminary assessment of water resources challenges; and 3) the results of public Listening Sessions. The section concludes with a summary of what we believe to be the most pressing water resources challenges; these form the basis for orienting our strategic goals and strategies.

General Trends Affecting Water Resources

Several general trends have implications for the development and management of America's water resources.

- **Globalization.** The world is both enlarging and shrinking from globalization. Globalization promotes opportunity through exchanges of information, capital, goods, services, and people. The Internet has spearheaded a global communications revolution. Global trade has stimulated the free movement of capital, paved the way for companies to expand around the world, increased wealth, brought national borders closer together, and fused national markets. Vigorous trade has raised living standards and created a growth boom in international travel. Globalization has spread understanding about cultures and democracy. On the other hand, the West's gain creates crises of rising expectations among those in poor societies, which can be disruptive and destabilizing forces. The livelihood of low-skilled workers in the U.S. is threatened as manufacturing shifts from America to low-wage economies overseas.

- **Economic Growth and Trade.** The percentage of the Gross Domestic Product attributable to foreign trade is growing. Foreign trade is expected to double over the next two decades. This has implications for navigation in America. Inland traffic is projected to grow by as much as 37 percent over the next 20 years. NAFTA will open U.S. ports (e.g., New Orleans, New York, New Jersey) to Canada and the Ports of Galveston and Mobile to Mexico. Interest in South American trade will increase transportation options connecting North and South America along the Pacific, Atlantic, and Gulf corridors. As global markets expand and shipping vessels grow to accommodate increased cargo, the demands of international commerce will require reliable channels and larger, more efficient domestic ports and harbors. Deeper and wider navigation channels will increase the demand

on dredged material placement, but the availability of acceptable sites for placing dredged material is rapidly dwindling.

- **Population Increases and Demographic Shifts.** By 2025, the U.S. population is expected to increase to a total of 338 million people. It is estimated that 35 percent of this population growth will take place in the West and approximately 21 percent to the Southeastern portion of the U.S. Water conflicts will increase in the water-stressed western states while the eastern states will focus on their aging water infrastructure. Since 1980, population migration to the coasts has outpaced the total U.S. population growth by 15 percent. Currently, more than half of the Nation's population resides along the East and West coasts. Population shifts to the coastline increase risks to people and property from coastal storms and hurricanes. Population increases endanger species and thus threaten biodiversity. As the average age of the population increases, pressure on recreational sources increases as well, increasing demands on water for leisure and lifestyle pursuits. The Federal Energy Regulatory Commission (FERC) has conducted river basin studies showing a potential 73,200 megawatts (MW) of additional US. Hydroelectric capacity. The Department of Energy has undertaken an assessment of hydropower resources showing that there are 5,677 undeveloped hydropower sites with a potential capacity of about 30,000 MW; 57 percent of this capacity is at sites with some type of existing dam or impoundment but no power generation. The National Hydropower Association anticipates that the regulatory burden associated with the federal licensing process will discourage this capacity from being developed by 2020 – unless domestic policy to reduce greenhouse gases changes, the hydro licensing process is improved to encourage investments in hydropower, licensing rules balance environmental and energy demands, commercial turbines become more efficient and advanced in design to become more fish friendly, there is increased appreciation for the ancillary benefits of hydropower to stabilize the electric grid, and it becomes more acceptable for green power programs to charge a premium for delivering clean and renewable electricity in a deregulated market.

- **Climate Changes.** Floods will continue to be a serious national problem as greenhouse effects increase, sea-levels rise, global warming trends continue, and the population migrates to the coastline. Our coastlines must absorb the impact of a predicted sea-level rise over the next 200 years; this translates into the loss of 200 feet of beachfront property for every 2-foot rise, beach erosion, inland flooding, and evacuation gridlock. A more affluent population bids up coastal property values to live close to water, increasing the amount of potential damages from flooding. Migration to

coastal areas will increase risks to life and property from storm-related coastal floods. Increased flooding causes erosion and escalates problems related to down-shore sediment management. Coastlines will shift and habitats and species will continue to be threatened and lost. Erosion attacks the integrity of public beaches, adversely affecting recreation. The occurrence of severe storms may cripple low-lying areas (e.g., Mississippi Delta) and inundate wetlands. This increases the public need for advanced measures, contingency planning, and evacuation planning. Sea-level rise exacerbates problems of salt-water intrusion into fresh water sources, affecting water quality. Water supply allocation problems worsen as droughts confront competitive demands for water for drinking, irrigation, and hydropower. Climate changes affect water resources management, coastal protection policies, and design procedures.

- **Urban Demands for Water Infrastructure.** Urban water problems are becoming more complex, and there are growing conflicts in regional water use among multiple users with diverse and often competing demands. By 2015, more than half of the world's population will reside in urban areas. Increases in population density in cities and suburbs will push settlement to exurbs and outlying areas, putting increased pressure on groundwater aquifers and rural water systems—many of them aging and inadequate to accommodate the growing population. As communities expand, they evidence growing urban flood control and stormwater drainage needs. There is the threat to public health from groundwater contamination from toxic and hazardous disposal sites and abandoned land mines. In May, 2002, the Congressional Budget Office estimated the annual investment in the Nation's water systems required to maintain high-quality drinking water and wastewater services to be between $11.6-$20.1 billion for drinking water systems and between $13 billion and $20.9 billion for wastewater systems.

- **Environmental Values.** Americans now place environmental values near the forefront of social priorities. They desire conservation and protection of the Nation's natural resources. They often demand restoration of previously degraded natural environments. There is increasing emphasis on ecosystem restoration, environmental stewardship, wetlands management, non-structural floodplain management, water quality, and pollution prevention. As a result of increased environmental sensitivity, there will be increasing incentives to develop and adopt innovative non-structural water supply solutions (conservation methods, low-cost technologies) for cost savings.

- **Aging Infrastructure.** We are operating and maintaining an aging water resources infrastructure nearing or extending its 50-year planned design life. Currently over 44 percent of U.S. inland waterway facilities are at least 50 years old. Ensuring expected performance levels requires rebuilding or replacing existing locks and dams, recreation facilities, hydropower facilities, and water supply facilities. But these demands must compete with other programs and investments. There will be pressure to reduce the water resources construction backlog for public infrastructure and to maintain and modernize existing structures.

- **Privatization and Outsourcing.** There is a strong and growing interest, supported by legislation and public sentiment, in privatizing and outsourcing government work. The move toward privatization communicates an intent to move resource allocation decision making from government bureaucracies to market-based forces of competition, accountability, and incentives. States have been most active in privatizing, and local governments are turning toward privatization because of budget deficits and a desire for cost-savings and increased ability to use beneficiary pay principles.

- **Information Technology (IT) Revolution.** Automation and information technology are revolutionizing the way we live, work, and learn. Information management capabilities are growing exponentially, allowing people to tackle more complex tasks, to grow their knowledge base faster, and to connect ideas, people, and technology more rapidly, effectively, and efficiently. IT facilitates extensive and intensive monitoring, analysis, archiving, and dissemination of information, thus increasing productivity. Information technology advances will affect water resources. For example, “pull-driven” trade markets rely on the accuracy and timeliness of information, communication, and transportation networks, making just-in-time approaches cost-effective options for transportation and navigation industries. Efficient vessel transport is expedited through forecasting of vessel movements, timing for locks, modernized approaches to scheduling, dispatching, tracking, and routing the delivery of goods. IT also impacts water transportation through new fuel sources, vessel configuration, and service efficiencies (e.g., global positioning systems). IT facilitates database management and systems modeling. Systems tools and mapping techniques can facilitate regional land use planning and environmental monitoring on a scale not achievable before. IT and telecommunications systems hold special promise for providing security and emergency management systems, such as evacuation systems.

- **Terrorism and Nuclear Fears.** The rise in terrorist activity, growing popularity of extreme religious factions, continuing conflicts between the "haves" and "have nots," and rising tensions between nations armed with nuclear weapons will decrease perceived stability and divert resources to homeland security and defense. Terrorism threatens national security through contamination of, or disruption to, water supplies. In current scenarios, the security of dams and reservoirs becomes a paramount concern.

- **Investment in Science and Technologies.** The science and technology workforce is becoming more global. Many countries are investing in science and technology (S&T) as a key economic strategy. The U.S. is investing in S&T capabilities through research and development (R&D). In 1998, the U.S. accounted for 44 percent of the industrial world's R&D investment. Investments in S&T are critical to America's ability to maintain our leadership in cutting-edge industries that power the global economy. Industrial firms are developing international alliances to strengthen their competencies and to expand into technology fields that are crucial to maintaining market share and to developing and sharing information technologies. The global diffusion of science and engineering education has implications for the education and business recruitment of scientists and engineers. Upgrading the U.S. educational system from K-graduate school is a major national priority at a time when competition for scientists and engineers is increasing. Statistics indicate that the Federal sector is not viewed as an employer of choice for new graduates.

- **Human Capital Crisis.** Although the Federal workforce is becoming more skilled, more educated, and more white-collar, it is also getting older. Nearly 75 percent of the Federal workforce is now over the age of 40. A looming retirement surge in the Federal government portends a human capital crisis. Retirements will hit state and local governments especially hard. Unless workforce succession planning and concerted training and retraining take hold, agencies will be left with skill gaps. Compounding the problem is that college graduates see the Federal government as a less desirable employment option than the private sector. Furthermore, downsizing, automation, and outsourcing create a demand for more highly trained personnel to manage contracts and to oversee highly technical information technology systems. Recruiting will not adequately address the shortage of IT personnel. Competition with the private sector for workers will increase pressure to boost government wages, to streamline the Federal hiring process, and to provide incentives for workforce restructuring. Government organizations are faced with a serious challenge to shape those factors that make Federal employment

an attractive option for students graduating from college and graduate school.

Assumptions

Several assumptions shape the Corps' planning environment over the next five years.

- The Congressional Budget Office and the Office of Management and Budget agree that budget deficits look likely in the near term. Federal budgets will remain flat.
- Budget priority will be given to protecting the homeland, winning the war on terrorism, and revitalization of the economy.
- Linkages between performance and Federal budgets will strengthen. Federal agencies will be asked to better tie agency results to spending decisions.
- The Administration views the Federal role as active but limited, citizen-centered, results-oriented, and market-based through competition.
- There will be a surge in retirements among Federal employees over the next five years.
- Reorganization of the Federal government to accommodate anti-terrorism and homeland security objectives will be ongoing.

Assessment of Water Resources Challenges

During Fiscal Year 2000, we conducted regional and national meetings—"Listening Sessions"—with our stakeholder public to hear their views about water resources challenges that have implications for the Civil Works Program. Prior to engaging our stakeholders, we conducted a literature review and met with water resources subject matter experts from academia and water resources consulting. This preliminary work highlighted six areas of concern:

1. **Stress on the national marine transportation system**: Our Nation's water highway system may not be able to meet 21st Century demands.
2. **Continued development of flood-prone areas**: Flooding continues to threaten our Nation's communities.
3. **An aging national water resources infrastructure**: America's water resources infrastructure may not support future generations.
4. **Environmental consequences of past development**: Our environment has been damaged and needs to be repaired to offer future generations sustainability of natural and cultural resources.
5. **Opportunities to leverage water resources for smart growth**: Many

communities lack adequate water and sewer systems necessary for their sustained development.

6. **An expectation to ensure the capability to respond to disasters**: Our Nation's capability to respond to disasters is being stretched.

We held 14 regional Listening Sessions and two national meetings around the country between June and November, 2000 to meet with our stakeholders per the requirements of the Government Performance and Results Act. The nearly 1300 attendees included representatives from other Federal agencies, state and local agencies, tribes, environmental organizations, port authorities, the private sector (e.g., consultants, legal professionals, tourism and recreational companies, developers), local interest groups, livestock/farming operators, navigators, journalists, and homeowners. The attendees identified 3,400 specific challenges, which were reduced to 18 challenge areas:

- Integrated Water Resources Management and Planning
- Communication/Coordination/Education
- Regulatory Issues
- Floodplain Management
- Marine Transportation System
- Environmental/Ecosystem Health and Management
- Federal Funding
- Water Quality
- Emergency Response
- Water Supply
- Wastewater Collection
- General Water Resources Infrastructure
- Data Collection, Analysis, and Dissemination
- Corps Project Delivery Process
- Federal and Corps Water Resources Policy
- Recreation
- Smart Growth and Development
- Coastal/Shoreline Management

Five Emerging Water Resources Challenges

The 18 areas can be collapsed into five major challenge areas (see Table 2). These are discussed more fully in this section.

Table 2. Emerging Water Resources Challenges

#1 Balancing Objectives (see page 16) - **Navigation** - **Floodplain and Coastal Zone Management** - **Smart Growth** ■ Aging Urban Infrastructure ■ Deteriorated Urban Stream Corridors ■ Lack of Urban Water Supplies ■ Lack of Water Conveyance Infrastructure	Achieve balance between traditional water resources demands and environmental/ ecosystem goals.
#2 Restoring the Environment (see page 27)	Repair negative environmental consequences from past development.
#3 Aging Infrastructure (see page 30)	Address the implications of an aging water resources infrastructure.
#4 Responding to Terrorist Threats and Disasters (see page 33)	Prepare for, respond to, and recover from emergencies proactively, including homeland security threats
#5 Minimizing Institutional Inhibitors to Effective Water Resources Management (see page 37)	Pay attention to issues that can undermine effective water resources planning, decision making, management, and stewardship.

General Challenge#1: Balancing Objectives

There is a need to achieve balance between traditional water resources demands and environmental goals.

Our rivers and coastal waters play a vital role in carrying our Nation's trade and commodities. Historically, our floodplains have served as sites for commerce, agriculture, industry, and homes. Dams provide flood control, low-cost hydroelectric power, and water supplies for our homes, businesses, and farms. Such water infrastructure has contributed significantly to our Nation's economic prosperity and well-being. However, use of our water resources in these ways has also imposed costs on our environment. Habitat and species have been lost; wetlands have been filled in and their beneficial functions degraded. Increasingly society is unwilling to accept such losses and has called for balanced approaches that can provide acceptable levels of development while protecting environmental amenities. The term most often used to characterize this aim is "sustainable development." Whereas the ideal of sustainable development is well accepted, defining sustainable development in practical, project-specific terms is often a conflict-laden and contentious process. The most significant water resources challenge facing us as a Nation is finding appropriate balance between development and environmental quality. Striking this balance will require good science, enlightened policies, and a willingness to engage in honest debate. Several key areas where we seek better balance are discussed below.

Specific Challenge: Our National Marine Transportation System

Transportation systems affect all aspects of human society to include settlement patterns, land use development, economic activity, jobs and wages, energy and resource allocation, access to places of work, social life, and commerce, social equity, environmental quality, and overall livability in cities and communities. Our Nation's marine transportation system (MTS) consists of approximately 1,000 harbor channels and 25,000 miles of inland, intra-coastal, and coastal waterways, and 235 lock chambers. This system serves over 300 ports with more than 3,700 terminals for cargo and passenger movement, and connects to 152,000 miles of rail, 460,000 miles of pipelines, and 45,000 miles of interstate highways. One sixth of the movement of goods between cities is transported along inland waterways. These goods include strategic commodities such as coal, petroleum, chemicals, and industrial metals and materials. Improvements to the inland water system are estimated to provide $5.5 billion per year in cost savings. The Corps maintains 300 large commercial harbors that serve as the gateway for 98 percent of our foreign trade. Thirteen of these large harbors serve as military strategic ports that assist in the movement of military equipment for overseas deployment. The Corps also maintains over 600 smaller harbors that provide recreational as well as commercial benefits. Improvements to the deep draft navigation system are estimated to save $1.5 billion annually in transportation costs.

Annually the MTS provides enormous national benefits:

- Creates employment for more than 13 million citizens, and contributes about 8 percent of national Gross Domestic Product (GDP).
- Moves more than 2 billion tons of domestic and international freight having a value of approximately $1.01 trillion.
- Imports 3.3 billion barrels of oil to meet U.S. energy demands.
- Moves 68 percent of the Nation's corn exports and 71percent of soybean exports.
- Transports 134 million passengers by ferry.
- Serves 78 million Americans engaged in recreational boating.
- Hosts more than 5 million cruise ship passengers.
- Supports 110,000 commercial fishing vessels and recreational fishing that contribute $111 billion to state economies.
- Provides 3 to 20 times less pollution per ton of cargo moved, as well as reduced accident risk compared with alternate transportation modes.

However, this system is nearing capacity while demands on it will grow substantially from the projected growth of international and domestic trade. The total volume of domestic and international marine trade is expected to double by 2020 to more than 4 billion tons of cargo per year. Inland traffic movements are projected to increase from 630 million tons today to 830 million tons by 2020. This increase in traffic will stress the MTS.

It also now appears that the containership of choice is rapidly becoming a vessel requiring 50 – 55 feet of depth (Figure 2). Few US ports have this depth, but many international ports do. Ports in Halifax and Vancouver (Canada) and Freeport (Bahamas) are ready trade competitors.

Figure 2. The Mega-Containership Regina Maersk (Source: Asia Info)

Global competitiveness requires us to have ready ports, which in turn requires maintaining ready channels. Delays due to shoaling, environmental coordination, or lock lockages will not be tolerated by shippers. Failure to respond means a second-class marine system with less competitive ports, higher prices for consumers, less income for farmers, less economic growth, and fewer jobs.

A major hurdle to be overcome in meeting a potential demand for channels that can reliably serve mega-containerships will be in accommodating dredging requirements. Over the past 10 years, an average of 275 million cubic yards of material has been dredged for deep draft channels. With deeper and wider channels, greater quantities of dredge material will be produced – stressing both the physical capacity of the US dredging fleet and the ability to dispose of the dredged material economically and in an environmentally acceptable manner.

It is also sobering to note that more than 44 percent of the inland waterway locks and dams are at least 50 years old. Many locks are undersized for modern commercial barge movements, yet they are carrying more tonnage than they were originally designed for – and they will be asked to carry 30 percent more by 2020. Lock delays associated with aged facilities currently amount to over 550,000 hours annually, representing an estimated $385 million in increased operating costs borne by shippers, carriers, and ultimately consumers. Delays at undersized locks on the Upper Mississippi can add several days to transit times and increase transportation costs, reducing farmer income and international competitiveness. For example, the U.S. has already lost about 30 percent of former Europe market share of soybean sales to Brazil and Argentina, both of which have been investing heavily in their inland waterway systems to reduce transportation costs for farm exports.

Among the 36 locks with high average delays in 1998, 19 are on the Upper Mississippi River – Illinois Waterway system, five are on the Gulf Intra-coastal Waterway (GIWW) or its connecting channels, and twelve are on the Ohio River system. A lock modernization program has been underway since the passage of the 1986 Water Resources Development Act, with $1.7 billion invested on 14 locks to date and an additional $3.4 billion programmed for construction at an additional 13 locks. However, funding below optimum construction schedules for these projects has increased construction times by one to five years, resulting in total National Economic Development (NED) benefits that are not realized totaling $2.62 billion (based on original anticipated-but-not-realized construction schedules from 1995-2000), and an estimated $1.47 billion in transportation benefits foregone due to the cumulative impact of previous schedule delays.

Our Stakeholders Told Us . . .

Participants at the Listening Sessions agreed that the our Nation's navigation infrastructure is generally in need of modernization, especially with respect to **improving or replacing lock and dams on the Upper Mississippi and Illinois rivers** and **deepening harbors and shipping channels in the Great Lakes.** Areas of concern included navigation infrastructure improvements, **minimizing sediment build-up in waterways**, and providing **water transportation improvements** and funding support for poor and isolated communities **in Alaska**, where the water transportation system is the equivalent of the road system in the lower 48 states. Participants highlighted environmental issues related to **dredging and disposal of dredged material**, especially **in the Northeast**. Some called for improving the process for deciding about disposal siting and asked for financial contributions to be made by those who directly benefit from deeper channels. Many called for **comprehensive regional port planning** and modernization of the inland waterway infrastructure to allow greater capacity and efficiency. In Chicago, IL, several highlighted that current port and channel capacities still have to conform to outdated ship designs from the 1930's.

Specific Challenge: Use of our Floodplains and Coastal Zones

Flooding is the most destructive and costly natural disaster in the United States, accounting for 85 percent of all natural disasters that occur annually. The Nation has made a major investment in flood damage reduction infrastructure consisting of nearly 400 major lake and reservoir projects, 8,500 miles of levees and dikes, as well as hundreds of smaller local flood protection projects. These projects have prevented over $419 billion in riverine and coastal flood damages since 1928, returning nearly $6.00 in flood damage reduction benefits for every $1.00 invested, and, for example, preventing $20.8 billion in annual flood damages between 1991 and 2000.

Floods have affected the lives of more people than any other type of disaster, including war, drought, and famine. Events such as 1999's Hurricane Floyd brought flood disasters into American living rooms and underscored in graphic detail the enormous economic and social costs of flooding: personal trauma and stress on individuals and families from evacuations and life in temporary quarters, the loss of irreplaceable family heirlooms, as well as the destruction of place and neighborhood. People may remember the images on the evening news of an electrical fire that destroyed eleven buildings in the flooded downtown area of Grand Forks while firefighters could only watch helplessly (Figure 3). FEMA estimates that 94 million acres of the United States lie within the 100-year floodplain.

Despite the admirable record that has been achieved in preventing flood damages through our water resources infrastructure, the Nation still has a massive residual flood damage problem. Annual flood damages in the U.S. still average over $4 billion (emergency assistance costs plus property losses). Failure to respond to this challenge will mean more economic and social costs from floods that could have been prevented.

Figure 3. Flood-Related Destruction (Source: Grand Forks Herald)

All evidence indicates that floods, and the monetary and personal losses associated with them, will most likely increase in the future. Major sources of the Nation's continuing flood damage problem include extensive, and still growing, unprotected development in the "100 year" floodplains along the Nation's streams and shorelines, as well as development just outside the 100 year floodplain where floodplain regulations do not apply, but where there is still risk of less frequent, but still damaging, floods. Today less than 15 percent of the more than 20,000 communities in the United States have structural flood protection, and only 20-30 percent of at risk buildings are covered by national flood insurance. The Multi-Hazard Identification and Risk Assessment report published by FEMA in 1997 concluded that 9.6 million U.S. households and property valued at $390 billion are "at risk" from the 1 percent annual chance of flooding. The administrator of FEMA noted that the annual Federal budget for moving populations out of harm's way soared from $835,000 in 1993 to $10 million in 2000.

Our coastlines are a special concern. Rapid population migration to coastal counties is occurring. Since 1980, the population migrating to the coast

has grown to over 41 million. Along the East and Gulf coasts, about $3 trillion in infrastructure adjacent to the shoreline is vulnerable to erosion from flooding and other natural hazards. During this century, 23 hurricanes have caused damages in excess of $1 billion each (adjusted for inflation). Hurricane Floyd, a Category 4 hurricane that hit the East Coast in September, 1999 caused damages estimated at $6 billion and the loss of 75 lives. The coastal states of California, Texas, and Florida are each expected to grow in population by more than 36 percent over the next 25 years. In recent years, these states have sustained the greatest amount of flood damages.

Our Stakeholders Told Us . . .

Those attending the Listening Sessions expressed interest in both **floodplain management** and **coastal and shoreline management**. They endorsed continued investment in flood prevention, both structural and nonstructural approaches. They noted that flood control structures designed to protect agricultural land now must protect homes and industrial structures. One important issue raised consistently across sessions was the need to **update flood hazard boundary maps** and to identify flood hazards in unmapped areas -- especially in expanding cities like Phoenix, AZ -- so as to direct development outside these areas. The lack of **land use regulation of floodplains** -- due to lack of interest, lack of statutory authority, or lack of enforcement -- was highlighted as a special problem. Many questioned why the government subsidizes development in the floodplain and proposed that the government instead offer buy-outs to **discourage floodplain development**. Several people pointed out the demand for **improved flood monitoring and warning systems**. Many attendees highlighted aging flood protection structures that heightened risk of failure from lack of **maintenance**. A few mentioned the challenge of **managing increased storm runoff** due to development.

Discussion about coastal issues focused on **erosion of national beaches, streams, and rivers**. Participants touted the value provided by beaches and shorelines as buffers to protect infrastructure against storm waves; afford habitats for rare and endangered marine-dependent organisms; and provide sites for economically vital tourism. In Atlanta, GA, they discussed the **sediment management as a source of new strategies for beach replenishment**. In Chicago, IL, people complained about poorly planned jetties and seawalls as causes of erosion. Anchorage, AK participants expressed concern for erosion along rivers and coastlines and the effects of a shallow water table on their economy. Woburn, MA, attendees suggested a **national policy for coastal protection that considers shoreline protection, environmental resources, flood and erosion control, recreation, protection of open space, and beneficial uses of dredged material**.

A national Listening Session was held during the annual meeting of the National Association of Flood and Stormwater Management Agencies (NAFSMA) in San Diego, CA in October, 2000. There was near-universal appeal among NAFSMA members for the Federal government to better manage floodway encroachment and to discourage development in the flood zone; to consider flood control options; to update and maintain floodplain mapping; to increase funding for floodplain property buy-outs; to develop real-time flood warning systems and risk assessment process guidelines; to examine the implications of unfunded mandates on states and municipalities; and to resolve conflicting Federal laws, regulations, and policies. In addition, attendees asked to learn more about the Federal funding process (i.e., a manual would help), and they highlighted the difficulty small communities have in funding projects. Finally, they recommended an integrated Federal-state watershed approach, better planning guidelines, and sufficient resources to implement these guidelines.

Specific Challenge: A Desire for Smart Growth

Concepts of sustainable development are gaining prominence under the label of "smart growth." Smart growth represents an approach to development that emphasizes reinvesting in existing communities through partnerships to develop regional strategies for environmentally sustainable economic development. Water must be a key part of any smart growth strategy. Water supplies must be capable of supporting desired growth levels; and water infrastructure, such as sewers and distribution systems, must be available to move the water to and from desired locations.

In 1998, the American Society of Civil Engineers (ASCE) graded America's infrastructure and gave drinking water systems a "D" (poor) grade, noting that the total infrastructure requirements amounted to $138.4 billion then, with $76.8 billion needed immediately to protect public health. ASCE graded wastewater systems a "D+," noting the contamination to rivers and lakes and groundwater sites. They advised that it will take $140 billion over the next 20 years to improve wastewater treatment systems and build new plants. Solid waste received a "C-" (barely mediocre) grade and a caveat that expenditures for managing non-hazardous municipal solid waste were expected to grow.

The mayors of selected cities met with the Corps in 1999 and 2000 to discuss their needs for comprehensive watershed solutions; restoration of damaged ecosystems; flood damage reduction in a manner that preserves riverine and aquatic habitat while enhancing economic development potential; wetlands restoration; recreational enhancements; mitigation of ground subsidence; clean-up of contaminated sites (e.g., brownfields); and urban water

infrastructure (e.g., construction of combined sewer overflow storage, wastewater treatment, the full range of facilities required for urban water supply; and improved water quality data gathering mechanisms and methodologies).

Costs for developing and managing the Nation's urban water infrastructure are high and mounting. However, many communities lack water and water-related infrastructure necessary for sustainable development. The following challenges must be addressed if smart growth aims are to be achieved.

Aging Urban Water Resources Infrastructure: Center cities and inner suburbs often have old water distribution systems. Approximately 900 U.S. cities have combined sanitary and storm sewers. Approximately 17 million people in the U.S. are served by facilities that provide less than the required Federal level of secondary treatment. Pipes that are over 100 years old begin to fail, causing water pressure to drop, dirt and debris to be sucked into them, and bacteria and other pathogens to enter the water system. Gastrointestinal and immune disorders from germs in the water distribution system are on the rise. Cities and towns are wrestling with contaminants faster than EPA can regulate. Contaminated water poisons water supplies and closes recreational water sites. Water mains break over 237,000 times a year. U.S. News and World Report reported in its August 12, 2002 article on "The Coming Water Crisis" that fissures are spreading in the 70,000 miles of pipes that deliver water to homes and businesses in the U.S., concluding that utilities will have to make significant investments in rebuilding, repairing, or replacing underground water infrastructure. Investments in upgrading such systems must often be made as a precondition for attracting redevelopment and growth. The overall cost of urban water services has increased, particularly since 1985, as costs of developing new supplies and treating water and wastewater to new quality standards have increased. Inflation-adjusted expenditures for public water supplies by local governments increased by 42 percent over the period 1985-1995 (3.6 percent per year). Over that same period, real dollar expenditures for sewer services by local governments increased by 36 percent (3.2 percent per year). Only a modest portion of that cost increase was driven by a general population growth of 11 percent during that period. The result is that the real per capita costs of urban water services were 23-27 percent more expensive in 1995 than they were in 1985.

Investments in urban water systems (including water treatment plants and wastewater systems) provide a return on investment to the environment, public health, and the economy in terms of preventing billions of tons of pollutants from reaching America's rivers, lakes, and coastlines. The Water Infrastructure Network, a stakeholder group of state and local water management agencies and affiliated non-governmental organizations working to support the Clean Water Action Plan, estimates that America's water and wastewater systems face an

estimated funding gap of $23 billion a year ($11 billion a year for water systems and $12 billion a year for wastewater systems) -- $1 trillion -- for the next 20 years to replace aging and failing pipes and to meet Federal mandates for clean water. EPA estimates that upgrading water treatment facilities nationwide will cost $151 billion between now and 2016.

Deteriorated Urban Stream Corridors and Waterfronts. Run-off from past industrial development has degraded aquatic ecosystems resulting in aesthetic impacts, poor wildlife habitat, and risks to human health and safety. As urbanization continues, amenities associated with urban streams have become more highly valued. Planning and implementation of programs to protect and enhance urban stream corridors for multiple purposes is becoming much more common. Revitalized and restored waterfronts can be a source of community pride and economic development. Restored stream corridors not only enhance urban parks and fish and wildlife habitats but, when properly designed, also serve as stormwater conveyances and floodways.

Lack of Sufficient Urban Water Supplies. Public water supply requirements are increasing, while our supplies are not. Estimates of water use prepared by the United States Geological Survey show that the "Public Supply" category is the fastest growing category of use. The average increase during the period 1950-1995 has been about 580 million gallons per day per year, the equivalent of adding a city of 325,000 people every year. As demand has continued to increase, a number of major U.S. cities and urban regions (e.g., Boston, New York City, Washington, D.C., Atlanta, Dallas-Ft. Worth, South Florida, Southern California, Seattle, and Portland) have experienced demands that are near or exceed safe yields of their supplies. Coupled with the increasing rate of demand, the rate of reservoir storage capacity expansion has declined from a peak of 17.3 million acre feet per year during 1966-1970 to a rate of 0.8 million acre feet per year during 1981-1985. There is not much reserve capacity left. Of the total storage available for M&I use under the Corps' purview (9,525,000 acre feet), only 8.2 percent is not currently under contract, and most of that is in Oklahoma. As demand for public supply increases, calls for the reallocation of storage in existing reservoirs from agricultural and other uses to urban uses are likely. The Secretary of the Florida Department of Environmental Protection testified before Congress in March, 2001 that the drought in Florida speaks to an imperative for the Federal government to secure its role as steward of the public's common water resources by maintaining existing aquifers, rivers, and lakes as sources of public water supply. California is finding that storing and selling water is the key to its future. Drawing groundwater from aquifers requires impartial scientific studies of the potential impacts and inputs from key stakeholders.

There is a trend, however, to privatize both the construction and management of municipal water systems. Large foreign-owned water corporations are moving onto the U.S. scene, e.g., Vivendi from France and RWE from Germany. Public-private ventures will likely enter the picture, consolidating U.S. water systems into bigger systems that form partnerships with private companies to handle growing water treatment issues. Privatization works best with an accountability ethic promoting responsible management favoring water quality above profit. Privatization must be accompanied by effective oversight. The key to an effective relationship between public and private entities is a shared strategic vision for quality water management, including contingency plans for when the private company fails at the water management task or goes out of business.

Our Stakeholders Told Us . . .

Many of those attending the Listening Sessions talked about issues related to smart growth and development, water quality, water supply, and wastewater collection. People cited aging water supply infrastructure and noted that many communities lack adequate water and sewer systems. Participants spoke of environmental, economic, and quality-of-life concerns related to population growth, land use changes, and infrastructure planning and investment. They wondered if there would be sufficient water supply for an increasing population and increasing agricultural use, and pointed out that increasing urban development can negatively impact water quality. Attendees cited a requirement to **determine the relative availability, reliability, and accessibility of the water supply**. People stressed the necessity to **improve both rural and urban national water supply infrastructure, especially aging and inefficient systems**. They called for better planning and infrastructure investment, and balancing of environmental and economic development requirements so as to assure a high quality of life in the future. Some called for **strict land use regulation to curb growth.**

Participants identified a variety of water quality issues regarding drinking water, agricultural applications, environmental quality, and recreational uses. Many highlighted threats to water quality: non-point source pollution from agriculture and developed areas; industrial pollution; erosion; dredging; wetland removal; increased sediment buildup in rivers, streams, and lakes from structural development, farming, and shoreline erosion; and recreation (boating, swimming, and fishing increase contaminants and sedimentation in waterways). Many attendees asked for **regional or national water quality standards and more consistent standards across Federal, state, and local agencies**.

Many people commented on aging or inadequate sewage systems and septic systems operated by cities and towns and about how many growing communities are operating their wastewater treatment facilities beyond their design levels, leading to maintenance problems and contamination of waterways from combined sewer overflows (CSOs). Those in Chicago, IL and Williamsburg, VA stressed a requirement to **replace combined sewer systems with dual system** so as to -- a matter of local purview. Those from smaller towns, rural areas, and growing suburbs surrounding larger cities identified a need for **funding support to upgrade their aging and deteriorating wastewater systems – although this remains a local responsibility.**

Attendees in Chicago, IL and Louisville, KY perceived a threat to water quality from increased bacteria levels. In Phoenix, AZ, people highlighted the enormous backlog of work. Some participants called for **creative solutions to water supply issues**, such as water marketing, desalinization, and the use of icebergs. Dallas, TX participants noted the need for a **long-term funding commitment at all levels of government**. In Hawaii, people recommended **reusing wastewater** (e.g., for irrigation) because of limited water supplies in the islands.

Overall, attendees asked for funding support for water and sewer projects in growing areas and for upgrading water and sewer systems in older urban areas, and removal of subsidies for sprawl. They highlighted that **water resources planning and management need to be integrated with land use planning and management**. Those from small towns and municipalities cited a demand for Federal expertise to identify needs, to seek services for improvements, and to administer programs.

General Challenge #2: Restoring the Environment

There is a need to repair negative environmental consequences from past development.

Concern for the environment is commonly accepted today as a goal of development. However, until the passage of the National Environmental Policy Act (NEPA) in 1969, economic development often proceeded without necessary consideration of the environment. The results have been degraded water quality, loss of fish and wildlife species and their habitat, and decreased recreational opportunities. Over the past 30 years, the Nation has become much more

attuned to the many ways healthy ecosystems support the economy and provide for the public good. Even though progress has been made, the legacy of the past remains. The environment has suffered a heavy toll from past development and should be cleaned up, restored, or developed with a new ethic fostering sustainable use for both current and future generations.

The United States has more than 3.6 million miles of rivers and streams, ranging in size from the Mississippi River to small streams. These river and stream corridors are complex ecosystems that perform a number of ecological functions, such as modulating stream flow, storing water, removing harmful materials from water, and providing habitat for aquatic and terrestrial plants and animals. The cumulative effects of development have resulted in significant changes to these ecosystems. According to the EPA's 1996 National Water Quality Inventory, only 56 percent of the 693,905 miles of rivers and streams surveyed fully supported multiple uses, including drinking water supply, fish and wildlife habitat, recreation, agriculture, as well as flood prevention and erosion control. Of the remaining 44 percent, water quality was good but threatened in 8 percent of the surveyed miles, while the last 36 percent were in fair to poor condition. Sedimentation and excess nutrients were the most significant causes of degradation in the rivers and streams surveyed, followed by bacteria, oxygen-depleting substances, pesticides, habitat alterations, suspended solids, and metals. The American Fisheries Society lists 364 species or subspecies of fish as threatened, endangered or of special concern -- the vast majority of them at risk because of habitat destruction.

Of the 12,400 miles of streams and rivers in the U.S. impacted by acid mine drainage, 85-95 percent receive the pollution from surface and underground mine lands abandoned prior to the enactment of the Surface Mining Control and Reclamation Act (SMCRA) of 1977. Left behind are rotted support structures in jeopardy of collapse, open shafts and open pits, unstable highwalls, deadly gases, explosives, stock piles of toxic and physically unstable waste materials subject to erosion. The damage from abandoned mine lands includes landslides, flooding, water pollution, destruction of fish and wildlife habitats, not to mention impairment of natural beauty, damage to private property, creation of hazards dangerous to life and property, and a general degradation of the quality of life in local communities.

Within the contiguous United States, over 53 percent of the Nation's original wetland acres has been lost, although the rate of wetlands loss has slowed measurably since the early 1980's (see Figure 4).

By 1995, only about 46 percent of the country's original wetlands remained. Wetlands annually provide about $14.8 billion in ecosystem services such as

flood regulation and waste filtration. Wetlands in particular provide important habitats for estuarine and marine fish and shellfish, waterfowl, shore birds, wading birds and mammals. Approximately 35 percent of all Federally listed rare and endangered animal species either live in or depend upon wetlands, and the EPA has estimated that coastal wetlands along the Gulf of Mexico provide essential habitat for three quarters of the Nation's migratory waterfowl.

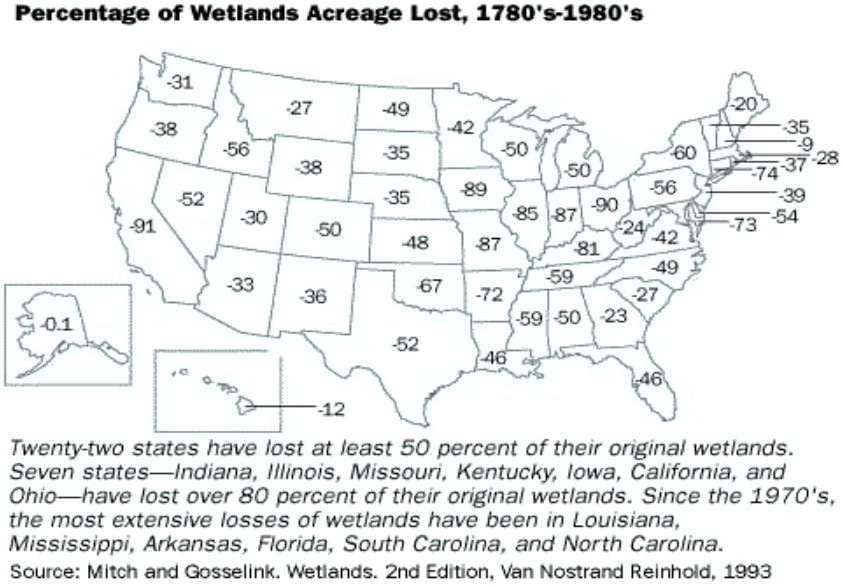

Figure 4. National Loss of Wetlands Acreage

Our Stakeholders Told Us . . .

Discussion about the requirement to protect and restore the environment was common at all Listening Sessions. Participants expressed concern that ecosystems, particularly wetlands, and the environment are not being adequately protected or restored. They noted the cumulative negative impacts of development (dam construction, dredging, water level manipulation, and channelization) on ecosystems functions related to water filtration, floodwater storage, recreation, and species habitat, and they lamented that these are not being taken into account sufficiently. People also commented about the impacts of global warming on wildlife and human habitats.

Participants recommended improving ecosystem health through **more public education about environmental issues; distribution of specific environmental data** about existing environmental conditions, the effects of

development, and the effectiveness of restoration activities; and quantifying and including environmental benefits in decision making about mitigation and development opportunities. Those from other Federal agencies spoke about the need to **coordinate agency policies better** and to **view environmental problems from a broad geographic perspective**. Some participants noted that traditional planning techniques are not as sustainable as they can be and called for more flexible "thinking outside the box." Some stated that cost-benefit analyses for project decision making are biased against projects with high environmental benefits. People recommended **making the environment a co-equal goal with economic benefits in criteria for selecting projects**. In Omaha, NE, participants talked about trade-offs between environmental benefits (e.g., protection of salmon) and economic benefits and research about exotic species, such as the Zebra Mussel. Water quality in national wildlife refuges was a heated topic of discussion in Anchorage, AK. Protection of wetlands, habitats, and species was the subject of pointed discussions in Louisville, KY, St. Louis, MO, Woburn, MA, and New Brunswick, NJ.

General Challenge #3: Aging Infrastructure

There is a need to address the implications of an aging water resources infrastructure.

Water infrastructure has improved the quality of our citizens' lives and provided a foundation for the economic growth and development of this country. Our water supply systems, water treatment systems, flood protection works, multi-purpose projects, and water transportation systems all contribute to our national prosperity. The benefits are realized as flood damages prevented, reduced transportation costs, electricity, and provision of recreation, and water supply services. For example:

- Navigable channels provide an efficient and economic corridor for moving a staggering 2.3 billion tons of the Nation's domestic and foreign commerce.
- For every $1 invested to improve navigation infrastructure, U.S. Gross Domestic Product (GDP) rises more than $3.
- Flood protection, on average, prevents $22 billion in damages per year, saving $6 for every $1 spent.
- Thousands of cities, towns and industries rely on the 9.5 million acre feet of water supply storage from 116 lakes and reservoirs in the U.S.

- Hydroelectric power dams produce enough electricity to supply 4.64 million homes with power and produce $533 million in revenues to the Federal Treasury.
- Coastal projects protect 426 critically eroding miles of the Nation's shoreline.
- Over 30 percent of the recreation and tourism occurring on Federal lands take place on Corps water resources projects.

Public infrastructure (including water resources infrastructure) investments in 1960 amounted to 3.9 percent of the Federal budget. Today the figure is more like 2.6 percent. Of this amount, the share for water resources declined from 1.1 percent to about 0.2 percent (see Figure 5), suggesting that water resources infrastructure investment has declined at a much greater rate than public infrastructure investment as a whole.

The value of the Corps' capital stock rose from the 1930s until it reached a peak in 1971 of approximately $150 billion. At that time, Civil Works Program appropriations declined sharply, resulting in a decrease of investment in the Nation's water resources development projects (see Figure 5). Since 1981, the Corps capital stock has lost over 17 percent of its value, and is now estimated to be $119 billion (in 1993 constant dollars).

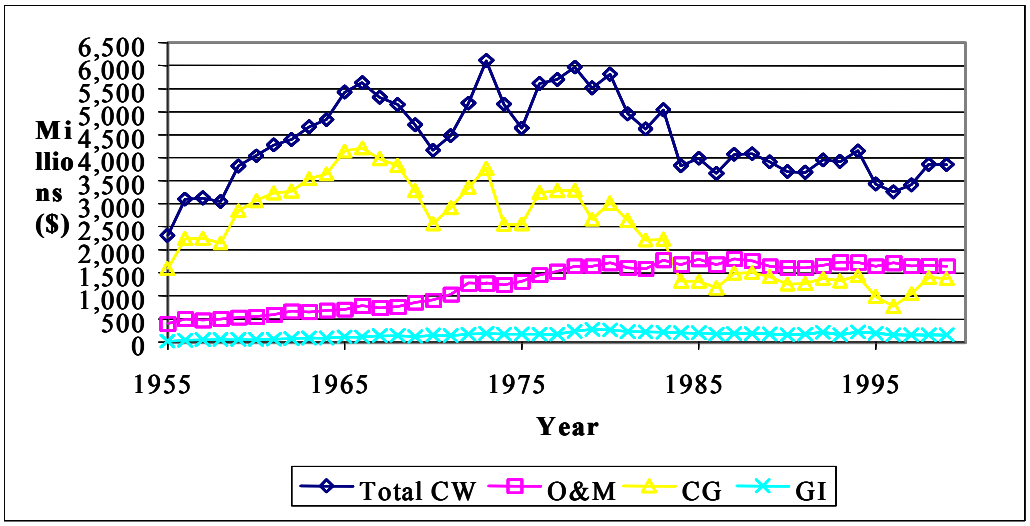

Figure 5. Current Dollar Trends in USACE Civil Works Appropriations (1995 Constant Dollars)

The U.S. population and the economy have continued to expand since the 1950s and 1960s when construction of new water resources projects was at a historically high rate. Indeed, over the last thirty years the U.S. population has increased more than 70 million (40 percent) while the GDP has grown from $2.5

trillion to $7.5 trillion. Forecasts over the next twenty years predict that the population will grow another 50 million. The GDP for 2010 is projected to be around $12.5 trillion. Undoubtedly this will place a greater demand on the performance of the national water resources infrastructure.

Failure to invest in maintenance, major rehabilitation, and new infrastructure leads to the gradual reduction in our capital water resources stock, affecting the benefits that we can receive from it. This may have long-term repercussions in terms of a potential reduction in our economic prosperity, quality of life, global competitiveness, and environmental sustainability.

Recreation is an example where new investment is vitally needed. Recreational opportunities abound near reservoirs and dams in places where boating, swimming, and fishing otherwise might not be available. The Corps hosts 380 million visits annually. Visitation generates 600,000 full or part-time jobs, and boaters and fishermen using Corps recreation facilities pump billions into the U.S. economy. Unfortunately, one quarter of the Nation's 4000 outdoor recreation sites at water resources projects are in need of significant modernization. Many of these sites have deteriorated from lack of adequate maintenance to the point where they have health and safety concerns; others are undersized for contemporary outdoor recreation equipment, or do not support the diversity of outdoor recreation pursuits of our multi-cultural society.

Our Stakeholders Told Us . . .

Concerns about the state of the Nation's existing water resources infrastructure were raised at every listening session. People worry that an unreliable and under-performing infrastructure puts property, lives, and livelihoods at risk and may become more expensive to replace or repair than to maintain. They were especially concerned about a perceived **lack of funding for infrastructure maintenance and new construction requirements**. Participants called for an **objective system to prioritize the most vital water resources development requirements in the national interest**. Some recommended **addressing the backlog of infrastructure and maintenance** over new project authorizations. Many called for more infrastructure **funding assistance to rural and poor communities**; some for public-private financing arrangements. Most observed that multi-purpose projects have advantages over single-purpose projects and advocated designing infrastructure in a way to balance economic and environmental objectives.

Those in Alaska expressed consternation about the lack of basic infrastructure funding, especially for maintenance, in rural communities. In Dallas, TX, people were concerned about the impacts of population growth on existing

infrastructure. In Louisville, KY, Vancouver, WA, St. Louis, MO, and especially Washington, D.C., many participants stated that the proper level of priority has not been given to recreation and called for making recreational use a legitimate project purpose. While they acknowledged growing conflict between recreational users of waterways and the marine transportation system, participants voiced a demand for **better waterway management** to allow for efficient commerce and safe recreational use in the face of increasing congestion and potential safety issues. They recommended **increased communication and coordination about recreational use of waterways** (Washington, D.C.), a licensing program for recreational users (Louisville, KY), **greater consideration of recreation benefits in project justifications** (Washington, D.C., and Vancouver, WA), and construction of wetlands and parks along waterways to benefit bird watchers and mitigate flooding (St. Louis, MO).

Challenge #4: Responding to Terrorist Threats and Disasters

There is a need to prepare for, respond to, and recover from emergencies proactively.

The events of September 11, 2001 shook America to her core. The attacks on the World Trade Center and the Pentagon profoundly affected how the U.S. views its vulnerability to terrorism and policies regarding nonproliferation. The terrorists who struck on September 11 changed the thinking about what is possible with respect to threat management. Everything from public buildings to drinking water sources to reservoirs is now viewed as a potential terrorist target. A fundamental role of government is to provide support and assistance when individual resources are overwhelmed. The U.S. must also do all it can to protect people and vital infrastructure from harm. Given the risk of terrorist attacks to the water supply, integrity of dams and nuclear power plants, and the vulnerability of water, transportation, energy, and telecommunications infrastructure, we cannot afford to be complacent. Since September 11, the Nation and the Corps of Engineers have had to maintain a heightened state of readiness to secure critical infrastructure related to water supply, reservoir protection, waterborne commerce, and electric power from intentional attacks. The vulnerabilities of Corps projects to terrorism include structural damage or destruction to a dam retaining structure resulting in failure of the dam and subsequent massive flooding downstream; biological or chemical contamination of water stored in flood control reservoirs; damage to navigation facilities; hydropower plants; and contamination of

municipal water supplies at Corps of Engineers reservoirs.

The Army Corps of Engineers manages 237 locks and dams, 926 coastal and inland harbors, 11,000 miles of navigation channel, 456 major lakes and reservoirs, 75 hydroelectric power plants, 4000 recreation sites, 1 drinking water treatment plant, and $1.2 billion in research and development facilities. In this high-threat era, this infrastructure needs protection to ensure that it delivers projected levels of service. A loss to part of this vast infrastructure could cause significant economic impacts. Energy production and water navigation fuel our economy. The hydropower produced by the Corps represents 24 percent of the total national hydropower generating capacity, or 3 percent of the total U.S. electric capacity. The ports and waterways handle foreign cargo valued at $673 billion. Major parts of the inland waterways system depend on locks to move commercial barge tows carrying crude oil, petroleum products, farm and food products, and coal. Catastrophic loss of major dams could devastate cities located downstream, as well as disrupt water supply in reservoirs managed by the Corps of Engineers. The financial impacts of the attacks on the World Trade Center and Pentagon are staggering -- $95 billion and 83,000 jobs lost -- including loss of life, infrastructure replacement costs, equipment losses, debris cleanup, interruption to businesses, lost productivity, and lost revenue.

The events of September 11 revealed the requirement for: a) better detection and warning systems for a terrorist attack; b) centralized catastrophic disaster response coordination at the Federal level; c) better coordination among the public health and disaster medical systems; and d) improvements in core capabilities of some states and localities to manage a massive disaster. Implications of dealing with September 11 include improved warning and alert systems, improved detection and treatment for chemical and biological agents, improved intelligence gathering and analysis from both domestic and international sources, changes in emergency management systems and personnel training, and the requirement for more national counter-terrorism exercises.

In the current era, state-of-the art monitoring equipment and alert systems become critical for alerting owners and operators to unexpected disruptions in the function of their water and energy delivery infrastructure. Project design must take security considerations into account in addition to safety considerations. Planning must be done to assess system vulnerabilities, and readiness programs must incorporate biological and chemical attack scenarios to a greater degree – especially in large metropolitan areas. For example, comprehensive planning is required to protect water supply systems, including treatment, pumping, and storage facilities. Both technology and eyes are needed for surveillance. Security assessments will have steep price tags. Early estimates made by the Corps total $267 million the first year and $65 million annually thereafter.

Risk management requires new ways of thinking about threats today. Terrorist incidents may be larger in scale, longer in duration, and more complex in the range of hazards presented than large natural disasters. Response campaigns may have to be sustained. Recent warnings of cyber attacks highlight electrical generation and transmission and water storage and distribution systems as possible targets; the Corps manages such facilities. The September 11 incidents produced tremendous rubble, debris, air choked with fine particles, human remains, and hazardous materials – not to mention the risk of follow-on attacks. Equipment, training, and preparedness programs must be able to accommodate such hazards. When the sites are also crime scenes, the situation gets more complicated. Moreover, having to deal with an influx of unskilled volunteers expands the emergency responder's role, particularly regarding site management, command and control, and information management. The Federal government becomes a partner with state and local law enforcement personnel to provide a first line of defense in guarding energy supplies, water resources, bridges, tunnels, inland waterways, ports, and many local and regional airports.

Natural disasters have not disappeared in the face of more imminent man-made disasters. In recent years, the United States has experienced a series of major disasters that have accumulated huge impacts measured in terms of lives lost or changed forever, and expenditures of funds for property damages and relocations. The losses are economic, environmental, and social. They include loss of jobs; disruption of family life; business failures; chaos in communities for weeks; loss of income and tax revenues; diminished capability of public health care systems; public health risks due to disruption in safe water, sanitation, food, and shelter; transportation delays; the spread of physical and mental illness; and impacts on other government programs from diversion of tax dollars to disaster response, relief, and recovery. Each disaster declaration represents significant expenditures of public and private funds. The repetitive nature of damages in many areas of the country illustrates the requirement for new strategies to effectively mitigate for, respond to, and recover from the many hazards that are prevalent throughout the United States.

The Federal Emergency Management Agency reports that there have been an average of 54 major Presidential Disaster Declarations per year from 1996 to 2001. The U.S. has sustained 44 weather-related disasters over the past 20 years in which overall damages and costs reached or exceeded $1 billion per incident. Thirty-eight of these disasters occurred during the 1988-1999 period, with total damages/costs exceeding $170 billion. In the past 15 years, the U.S. has experienced Loma Prieta and Northridge earthquakes in California; record flooding in the Midwest, California, and other regions; hurricanes Andrew, Inicki, Marilyn, Fran, and Georges, among others; a rash of fires across the country; 273

documented dam failures across the Nation. In the Atlantic region alone, the period between 1995 and 1999 saw 65 tropical storms, of which 20 were major Category 3-5 hurricanes along the Atlantic coast. The cost of disasters runs high: over $180 billion just between 1998 and 2000, and a loss of more than 10,000 lives since 1900. The National Science and Technology Council estimates that the structural losses from natural disasters averaged $1 billion a week between August, 1992 and December, 1995.

Given the magnitude of disasters in recent years, new ways are needed to address disaster preparedness, response, recovery, and mitigation. In fact, every Federal, state, and local agency charged with emergency management responsibilities is stepping up to the task with the support of the private sector. On the one hand, the country needs to be prepared to respond quickly to disasters before they occur. On the other hand, the Nation needs to avoid, withstand, and minimize economic losses from disasters to the extent feasible.

A highly trained and professional emergency management workforce is an absolute requirement since there is no time for delay or indecision during disasters. The American public expects a ready, willing, and able Federal capability to be prepared to deal with multiple contingencies. Fractionated planning and coordination among key agencies required to work together to perform the readiness requirements under the Federal Response Plan can lead to needless duplication of responsibilities and inefficient an ineffective use of resources.

Disasters know no national boundaries. Many countries cannot respond without external assistance. When U.S. assistance is requested and approved, the U.S. Agency for International Development (AID) coordinates the U.S. government response. Increasingly, AID is looking to the Department of Defense to augment international assistance. A recent report by the Subcommittee on Natural Disaster Reduction is looking for new ways to structure international emergency management assistance in preparedness, response, and recovery. Currently, there are no formal “Emergency Support Function” elements involved in international planning and operations support abroad. Some form of international public works and engineering organization could address this support requirement.

A failure to invest in the capability to support an international emergency management role will discount the power of the assistance provided through domestic emergency management roles to promote peace and stability abroad. Our engagement with other countries to help them develop their resources and infrastructure and to safeguard their environment through disaster recovery operations can provide benign engagement with other countries for extended

benefits.

Our Stakeholders Told Us . . .

Although the subject of emergency management was not raised vociferously at every listening session — and the sessions occurred prior to September 11-- there was a consistent general sentiment expressed across meetings that there is a **demand for better coordination and planning of response activity**, and particularly for more local involvement and establishment of a **proactive approach to emergency management**. Those who have suffered the most devastation from natural disasters, such as participants attending the Sacramento, CA session, but also at Dallas, TX, St. Louis, MO, Louisville, KY, and Honolulu, HI, focused on water-related emergencies. They emphasized the need for funds and manpower to **improve stream gauge readings** to **better monitor potential flood emergencies**. In St. Louis, people suggested a centralized stream gauge operation and standardization of gauge readings. The Coast Guard highlighted an aging fleet for navigation safety. Regional resources are limited for cleanup of oil spills and other hazardous materials, according to those in Louisville, KY. Emergency managers attending the Sacramento, CA session highlighted a requirement for improved response capability on the part of the Corps and suggested **coordinated funding for both FEMA and the Corps** so that recovery operations managed by the Corps are expedited without burden to local resources.

General Challenge #5: Minimizing Institutional Inhibitors to Achieving Effective Water Resources Management

There is a need to pay attention to issues that can undermine effective water resources planning, decision making, management, and stewardship.

Listening Sessions provided the opportunity to receive feedback about those processes and practices which both help and hinder the management of this country's water resources infrastructure and related activities. This discussion spanned issues related to Federal and Corps water resources policy and processes for the regulation of the Nation's waterways and wetlands; planning procedures for new water resources development; and the Corps' project delivery process. In addition, attendees provided a litany of both complaints and suggestions regarding coordination within and across agencies, and processes for

planning, justifying, funding, managing, and evaluating projects. These issues are described below.

Our Stakeholders Told Us . . .

Water Resources Policy. Many people emphasized a need to **update policies related to recreation, water supply, shoreline protection, environmental restoration, and water quality**. At a minimum, they said, there is a need to review policies to ensure consistency—both within and across agencies. They pointed out overlapping responsibilities among Federal agencies and called for closer cooperation among them. Time and again, people highlighted the **requisite for regional policies** or ways to improve coordinated broad-scale planning, for example with respect to the Endangered Species Act.

Incorporation of non-structural approaches for flood and storm damage reduction was a case in point. Some believed that current Corps evaluation policies favor the use of structural measures over more environmentally friendly non-structural approaches. Participants at the Sacramento, CA, Chicago, IL, New Brunswick, NJ, and Woburn, MA Listening Sessions believed that the Corps should place more emphasis on shoreline protection. In some cases, a **culture change** is needed, people said, clarifying that a **shift from regulator/advisor to facilitator/partner** may be in order for Federal agencies like the Corps. Those attending the Phoenix, AZ session pointed out the need for more flexibility in applying Federal water policy to unique local hydrological conditions. Some stressed the value of pushing decision making to Corps District and local levels to **increase flexibility and responsiveness to local issues**. A few spoke about the need for greater flexibility in supporting local requirements. Other participants called for **independent technical review of large projects**. Points of view seeking major reform of the Corps, on the one hand, ran head on into viewpoints favoring allowing things to continue on their current path.

Regulatory Issues. Attendees called for **streamlining the regulatory process** by: shortening the permitting time (especially for Clean Water Act, Section 404 permits), simplifying the process, providing easy tracking of permits after they have been submitted, obtaining more consistency along with the ability to particularize regulations to meet regional challenges, closing loopholes, and achieving better balance between commercial/industrial beneficiaries and community and environmental beneficiaries. People want to **see Federal-state communication improve**. Many called **for better enforcement of regulations**. Some highlighted staffing shortages as contributing to processing delays.

Federal Funding. Two themes were expressed almost universally across the Listening Sessions: 1) lack of funding to repair and replace aging

infrastructure, and 2) problems with cost-sharing formulas for disadvantaged communities. Participants called for **greater attention to ability-to-pay issues, a re-examination of cost-sharing percentages of local sponsors, and perhaps allowing local sponsors to "pay-as-you-go" for construction rather than provide up front financing**. Attendees viewed full funding of navigation projects at a level matched to the Inland Water Way Users Trust fund as desirable.

Corps' Project Delivery Process. The Corps' project delivery process was mentioned during discussion of many water resources challenges. A common thread was the need to **streamline the process to deliver projects faster**. Attendees made several recommendations to improve the process: **delegate authority further down the chain of command; re-examine study methodologies — especially how to make economic principles for cost-benefit analyses less restrictive; take into account the full range of benefits (environmental, social, cultural -- not just economic) in deciding the worth of a project**; and **involve all stakeholders in the process from the beginning**.

In Sacramento, CA, participants wanted a reduction in the time and costs for operations and maintenance and suggested that the Corps not turn management of projects over to others. They also stated that planning should consider future fleets and global shipping trends, and that planning criteria should expand project benefits to include custom revenues, land creation, and environmental mitigation and restoration. Anchorage, AK participants expressed concern about having a special provision in project evaluation criteria for meeting the demands of the rural areas of Alaska; they suggested including subsistence fishing as part of accepted economic evaluation criteria. People in San Diego offered that local agencies have some core competencies that can help the Corps expedite project development and delivery processes. For example, many local sponsors have flood management capabilities that can be used to implement floodplain management practices.

Data Collection, Analysis, and Dissemination. Attendees voiced concern that sharing of data is limited across agencies, non-governmental organizations, and stakeholders. Lack of coordination and communication leads to needless duplication of studies and inefficient utilization of taxpayer funds, thus limiting the potential for developing solutions to complex problems. Participants across the Listening Sessions called **for better management of project studies, project development, and monitoring programs to allow for unified data sharing, including better access to available data**. Some attendees imagined a large data clearinghouse – a "one-stop-shop"—to make water resources data universally available to concerned communities of stakeholders for enhanced coordination for planning and project development, especially with respect to

assessing national and regional challenges and formulating regional, watershed, river basin, and coastal zone plans. In addition, people cited that many agencies are not applying the most advanced technologies and models available in their management of infrastructure, floodplains, and watersheds. **Current geographic information systems (GIS) technology should be more readily available** to the general public, people stated.

Issues regarding data collection, analysis, and dissemination were popular topics of conversation in Anchorage, AK, Woburn, MA, and Omaha, NE. Participants in Anchorage commented on the lack of updated floodplain maps and adequate engineering and environmental data; charts predating the 1964 earthquake that struck Anchorage are still being used. They asked for more accurate maps showing current permafrost and coastline data. At the Woburn, MA listening session, participants echoed the need for FEMA to replace old floodplain studies and maps, taking into account potential dam failures. They recommended that **Federal agencies adopt standardized analytical methods**. Omaha, NE participants expressed the **need for "good science" in the decision-making process**. They requested **accurate models** that depict surface water and groundwater interfaces to help in monitoring and managing the Missouri River Basin.

Communication, Coordination, and Education. Improved communication, coordination, and education of multiple constituencies were dominant themes identified by participants across all Listening Sessions. Attendees expressed disappointment with government agencies for not adequately involving stakeholders in project planning, operations, and decision making and touted the value of such involvement for building consensus and resolving conflicts, thus affecting the potential success of studies and projects. They were especially critical of agencies for not coordinating sufficiently and cited as examples failure to share data or to work toward common interpretations of policies and standards. They called for **increased partnering between and among Federal agencies** to reduce costs, decrease needless redundancies, and increase the likelihood of success. Partnerships build shared visions and serve to resolve conflicts. Attendees emphasized that if consensus can be accomplished around thorny water resources issues, our Nation's water resources could be managed with a greater chance of long-term sustainability.

Attendees highlighted the value of water resources education, both internally within agencies and with the general public and offered that **cross-training across agencies and multi-agency workshops** would be worthwhile. Educating students at all levels –even in K-12th grades --and citizens would foster better understanding of water resources requirements and processes and thus build appreciation for the rationale for investments in water resources

infrastructure, they said. People suggested using multi-media communications -- television, radio, periodicals, the Internet – to **bring government agencies and the public closer together in their understanding of water resources requirements and impacts**.

Communication and coordination were hot topics in Atlanta, GA, St Louis, MO, and Vancouver, WA. In Atlanta, attendees said they wanted more stakeholder involvement in projects. In St. Louis, participants wanted more partnering between agencies and expressed a desire to prioritize projects. Those attending the Vancouver, WA session wanted **better agency coordination**, especially **with local communities and tribes**.

Moving Toward Integrated Water Resources Management Through a Watershed Perspective

We listened. We heard.

A resounding recommendation obtained from talking to our stakeholders and the public is the need to move toward greater integration in planning for and managing our Nation's water resources. Participants at our Listening Sessions told us:

> "The most significant water resources challenge facing us as a nation is continually seeking the appropriate balance among social goals, economic development, and environmental quality in specific resource-use ways."

Listening session attendees called on the Federal government to achieve more integrated management of our Nation's water resources. Specifically, they recommended that the Federal government:

- Analyze water resources challenges, options, and solutions comprehensively at a watershed level;
- Support the development of regional visions for each major watershed;
- Identify watershed-level goals that can be implemented locally;
- Seek water resources solutions that balance ecosystem restoration with environmental sustainability and economic development goals;
- Create forums for planning and discussion and apply conflict resolution methods;
- Identify issues to facilitate more integrated management of watersheds and river basins.

Integrated water resources management is the right thing to do to meet national water resources challenges.

The call to manage water in an integrated fashion is echoed in the 2001 Final Report of the National Watershed Forum; the 1999 report by the National Research Council, New Strategies for America's Watersheds; the 1999 report by the Committee to Assess the U. S. Army Corps of Engineers Water Resources Project Planning Procedures, the Water Science and Technology Board, the Commission on Geosciences, Environment, and Resources, and the National Research Council, New Directions in Water Resources Planning for the U.S. Army Corps of Engineers;, and the 1994 report of the Interagency Floodplain Management Review Committee to the Administration Floodplain Management Task Force, Sharing the Challenge: Floodplain Management into the 21st Century. All recommended that the Federal government strive for greater integration of water resources activities through a watershed perspective.

A watershed approach can help us achieve integrated water resources management. Managing water resources in a watershed context promotes collaboration, facilitates greater balance among competing water uses, and accommodates resource leveraging toward the achievement of common watershed goals. The foundation principles inherent to Corps planning – cost efficiency, environmental protection, and public participation – are consistent with the watershed approach.

A watershed perspective embodies a **systems approach** to assessing and addressing all threats to water supply, water quality, environmental degradation, and quality of life in a watershed. A systems approach examines the interconnectedness of all water and land resources in a watershed--chemical, biological, physical, hydrological, social, economic, and meteorological-- essential building blocks for enriching our quality of life, protecting public health, promoting the public's welfare, and preserving our regional heritages. By adopting a systems perspective to consider multiple aspects of a healthy watershed, the likelihood increases of making acceptable trade-offs among multiple stakeholders to derive commonsense but strategic solutions to competing demands for water supply, water quality, flood control, navigation, hydropower generation, fisheries, biodiversity, habitat preservation, and recreation. A watershed approach to integrated water resources management thus provides a comprehensive **interdisciplinary view** across the natural and social sciences regarding the management of diverse laws for clean water, clean air, fertile soils, productive fisheries, healthy forests, and robust communities within a single defined landscape.

A watershed approach facilitates several desirable outcomes:

- Seeking sustainable water resources;
- Integrating the management of water and related land resources;
- Coordinating planning and management;
- Promoting interagency cooperation;
- Encouraging public participation;
- Evaluating monetary and non-monetary trade-offs;
- Establishing an interdisciplinary team;
- Applying adaptive management.

The watershed is the best unit of analysis. Watersheds and river basins form logical hydrological units for planning and managing land, water, and ecosystems. Physical watersheds are areas of land where all surface waters drain into a single body of water, such as a stream, lake, wetland, or estuary. According to the U.S. Geological Survey, there are 2149 watersheds in the United States within 21 large river basins. The resources within watersheds are extremely valuable. The Environmental Protection Agency estimates that nearly $200 billion of food and fiber, $60 billion of manufactured products, and over $40 billion of tourism depend on clean water and healthy watersheds each year. Comprehensive plans and solutions have the advantage over piecemeal approaches for addressing both short-term and long-term water resources challenges without mortgaging the future viability of natural resources. Approaches are available that integrate physical, biological, social, and economic demands and sciences to meet regional challenges without harming the environment. The key is to adopt a mindset that treats human and natural systems as a whole.

Unfortunately, political boundaries do not necessarily conform to hydrological boundaries. Political boundaries often focus water resources requirements or localized benefits rather than regional or national benefits. This means that we must work harder across political boundaries to achieve larger benefits. Doing so calls for collaborative processes and inter-governmental collaboration in assessing demands and in developing solution options. The watershed provides a holistic geographic universe within which to conduct the needs assessment and to design water resources solutions. Solutions to watershed problems require a deeper understanding of natural phenomena and processes than we have taken in the past; large-scale analysis; interdisciplinary, integrated, and holistic methodologies; substantial stakeholder involvement; and bottom-up approaches. Advances in scientific knowledge, the linking pin provided by the Internet, a better informed and educated general public, a growing regulatory environment to ensure that national standards are met, and increasing demands for public involvement in decision making and public accountability for

taxpayer investments call for water resources investment decision-making processes that are more collaborative and transparent.

Water resources management in the 21st Century requires integration of a complex array of public values and institutional policies, regulatory frameworks (permits, licenses, and monitoring), planning criteria, operations, maintenance and design standards, and intergovernmental priorities within a process that favors a high degree of trust and transparency. The way to overcome the inefficiencies and ineffectiveness of our characteristic fragmented approach to water resources management in this country is to involve key stakeholders throughout the life cycle of water resources planning and decision making processes. Working through the labyrinth of multiple bureaucratic layers to find a common point of intersection across agencies and levels of government requires a great deal of public involvement. The approach to water resources planning and management must be holistic and inclusive.

In many fundamental ways, we are already doing integrated water management.

We are taking steps in the Corps to promote a watershed perspective to improve performance, customer satisfaction, and overall program efficiency and effectiveness. We are doing this through our Watershed Principles as codified in the Planning Principles and Guidelines (ER 1105-2-100, 1983, updated April, 2000) and Policy Guidance Letter #61, "Application of Watershed Perspective to Corps of Engineers Civil Works Programs and Activities." Two Corps processes also reinforce a watershed approach: interdisciplinary work that joins multiple perspectives, and adaptive management, a process of continuous improvement based on feedback obtained from interim results. Participation in planning and problem solving meetings by representatives from diverse disciplines accounts for the impacts of multiple activities on all critical resources in the watershed. Adaptive management indicates the willingness and ability to actively monitor results in terms of clear goals, objectives, and performance standards so as steer decisions toward sustainability. Opportunities for public involvement regarding specific water resources solutions throughout the planning and decision-making process afford additional input. Watershed work must be a team effort.

Our organizational structure reinforces a watershed approach as a first step toward greater integration across our Civil Works Business Programs. Our MSCs are generally organized along watershed boundaries (versus political boundaries). Our structure allows us to scope the planning, development, use, monitoring, regulation, and preservation of water and related land resources within a region.

We have authorizations for watershed-level and comprehensive studies that are multi-purpose and multi-objective in scope, for example, across floodplain management, ecosystem restoration, natural resources preservation, navigation, water supply, and recreation objectives. Increasingly, we are taking a comprehensive approach to water resources planning. Examples of large-scale projects include the Chesapeake Bay Agreement, the Upper Mississippi River System Environmental Management Program, the Gulf of Mexico Hypoxia Action Plan, the Louisiana 2050 project, CALFED, the Comprehensive Everglades Restoration Program (CERP), the Missouri River Mitigation Plan and Operating Plan, and the Columbia River Salmon Program. We are beginning the National Shoreline Study, and we have ongoing Regional Sediment Management demonstration projects. We have over 100 ongoing watershed studies. New efforts include the Morganza to the Gulf Study in Southern Louisiana, The White River Basin Comprehensive Study, The Bayou Manchac Watershed Study, The Sacramento and San Joaquin River Basin Comprehensive Study, the Upper Rio Grande Water Operations Model, the Hudson-Raritan Estuary Study, the Ohio river Basin Comprehensive Study, the Great Lakes Ecosystem Restoration Study, and the California Sediment Management and Coastal Zone Management Study.

We also integrate across our Business Programs in ways that promote a watershed perspective. For example, within our Regulatory Program, Special Area Management Plans (SAMPs) (Regulatory Guidance Letter 86-10) authorize "development of a comprehensive plan through collaborative interagency planning within a geographic area of special sensitivity for the joint purposes of protecting natural resources and facilitating economic vitality in coastal communities, coastal-dependent economic growth policies, standards, and criteria to guide public and private use of lands and waters." Where possible, we issue general and nationwide permits (vs. individual permits). These efforts support regional environmental goals while building on our core missions to provide navigation, flood damage reduction, and environmental restoration services. They are collaborative and multi-objective efforts. Rather than focus on single projects, the efforts aim to set a regional or watershed context for planning water projects and for finding logical points of intersection for integrating management activities to meet environmental quality, national and regional economic development, and quality of life goals. By including Federal, state, local, and non-governmental entities, these efforts consider problems and opportunities more holistically, and thus have a greater chance to analyze the full range of potential benefits and impacts for plans and decisions related to all water demands in a watershed.

We can do better. Three examples suggest that we are on our way.

1) The Comprehensive Everglades Restoration Plan (CERP) offers an example of how we are integrating multiple purposes and multiple players into a plan to restore one of the world's most significant ecosystems while providing important economic benefits. The comprehensive plan is a framework and a network to guide the restoration, protection, and preservation of central and south Florida's water resources, including the Everglades, to meet south Florida's water needs for the next 50 years. The Everglades is a system in peril. Development has changed the landscape, interrupted the Everglades' natural sheetflow, sent valuable freshwater to sea as a result, and lost more than half of the native wetlands. Rapid growth has worsened these problems. While the population of people has risen from 500,000 in the 1900's to more than 6 million today, the population of native birds and other wildlife has dropped, in some cases to nothing. CERP will result in a sustainable south Florida by restoring the ecosystem, ensuring clean and reliable water supplies, and providing flood protection. The plan requires the collaboration of a vast professional and concerned community to provide surface water storage reservoirs, water preserve areas, management of Lake Okeechobee as an ecological resource, improved water deliveries to the estuaries and the Everglades, underground water storage, treatment wetlands, removal of barriers to sheetflow, water storage in existing quarries, reuse of wastewater, improved water conservation, and many pilot projects and additional feasibility studies. The U.S. Army Corps of Engineers is working closely with the South Florida Water Management District in West Palm Beach, Florida and with the Florida Governor's office, as well as many other Federal, state, tribal, and local agencies, to develop the comprehensive plan through a very deliberate planning process. The Everglades is the Nation's largest restoration project. It will cost $7.8 billion and take more than 20 years to capture freshwater destined for sea and direct it back to the ecosystem to revitalize it while improving water supplies for people and farms. The success of this multi-purpose plan will require tremendous integration of perspectives, values, objectives, responsibilities, resources, and activities -- and patience.

2) Our emerging approaches to regional sediment management (RSM) provide another example of integrated water resources management already at work. RSM combines the benefits of shore protection and ecosystem restoration, with the Corps' traditional navigation mission to manage dredged material. RSM applies a systems perspective to problem solving and the management of sand and other sediments as regional resources through project planning, design, construction, and operations. The larger spatial and longer temporal perspectives of RSM require the integration of several disciplines and the collaboration of many agencies, levels of government, and stakeholders in RSM analytical, problem solving, and planning activities. Regional Sediment

Management easily moves us toward adopting a watershed perspective for management of both coastal and riverine resources.

Ongoing RSM demonstration initiatives reflect **characteristics of integrated water resources management**: a **systems approach** to managing sediment and dredged material as beneficial resources; **collaboration** among multiple stakeholders across Federal agencies and levels of government and with non-governmental organizations; scoping needs by logical geophysical boundaries (a **watershed perspective**), and the critical involvement of researchers and developers (**R&D**) to produce **systems tools, models, analyses, and syntheses**.

To illustrate, Mobile District's Northeast Gulf of Mexico Regional Sediment Management Demonstration project aims to shift the focus of Corps planners from specific projects toward a regional approach in which the Corps cooperates with state and local levels of government to manage sand as a resource across projects to improve coastal resource management. The objectives include maximizing the return of sand to the littoral system, reducing adverse environmental impacts, and increasing economic benefits. A technical working group of interested agencies and local academics has been formed to define problems and opportunities. Workshops have been held to introduce the regional sediment management concept to local interests, clarify ongoing and planned activities, solicit county and city involvement, identify local projects that should be integrated into the effort, and identify sources of information. Already, operational improvements have resulted through new sites for dredged material placement that improve the return of sand downdrift and that improve coastal beach nourishment. The RSM initiative is contributing to the development of shoreline management plans for Alabama and Mississippi. Mississippi-Alabama Information Exchange meetings foster increased understanding of resource management responsibilities and cooperation among Federal, state, and local government programs. A regional geospatial information system (GIS) is being developed to provide baseline data and historical data sets for the region, which will facilitate regional sand management decisions.

The benefits of RSM represent the kinds of outcomes integrated water resources management can provide:

- Synergy created by enhanced partnerships among the Corps and Federal, state, and local offices and between coastal and watershed stakeholders can improve business processes, data sharing, the quality of information, and understanding about problems, causes, and solutions. As key stakeholders identify institutional obstacles, they can better clarify policy and revise business practices. Improved process models, data, and

information management tools provide a foundation for future studies and projects in the region.
- Reduction of the O&M backlog by more effectively applying operations and maintenance (O&M) dollars and by leveraging funds across accounts for regional benefits.
- Long-term cost-savings attendant to rehandling of sediment material.
- Potential new sources of desirable sediment and better ways to conserve sediment.
- Improved sediment management methods, models, and measurement techniques through application of a GIS framework to the region.
- Operational improvements from improved channel efficiencies, increased disposal site capacity, optimized mobilization of dredging equipment.
- Improved accretion and erosion management and ecosystem restoration.

3) Opportunities are emerging to support states and cities more directly and holistically, specifically in urban riverine and coastal areas. Revitalization of urban waterfronts can be achieved through the rehabilitation of urban riverine and coastal resources consistent with urban land use and watershed goals. There are at least 1,000 communities in the U.S. with populations over 30,000 situated on a river or along a coast that are in need of modernization and redevelopment, especially in older city centers. At least 900 have combined sewer overflows; many have abandoned brownfield sites in floodplains. The U.S. Conference of Mayors testified in support of the Water Resources Development Act of 2002 to reauthorize an existing Army Corps of Engineers program to allow cities to partner with the Corps to develop and revitalize their urban waterfronts. We have examples of such work:

- The City of Denver is collaborating with the Corps to restore the environmental, economic, and social resources of the South Platte River and its tributaries—specifically to restore the river's aquatic resources through innovative designs. Through active partnerships, the city has improved river and wetlands habitats and reinvigorated the local community by refurbishing walkways, riverfront shops, restaurants, and residences.
- The city of Seattle has worked with the Corps and others to conserve habitats in the Upper Cedar River Watershed and to modify the Howard Hanson Dam to allow passage of salmon while ensuring flood protection for the city.
- Kansas City, MO is partnering with the Corps and the Port Authority of Kansas City to restore ecosystems along the Missouri River as a centerpiece of its downtown riverfront revitalization master plan.
- The Corps is restoring a portion of the San Antonio River downstream of

the River Walk. This project will provide ecosystem restoration, recreation, and economic development while maintaining flood damage reduction as part of the Comprehensive San Antonio River Improvement Project.

- The city of Boston is working with the Corps and watershed interests to restore the ecosystem and preserve the historically significant natural and cultural resources of the Muddy River.

We already do integrated water management, and we believe that we do it well. New opportunities are presented by achieving greater synergy across programs in collaboration with stakeholders who share our vision to create a sustainable water future. We believe that we can improve how we accomplish our traditional missions through watershed approaches that support the aims of state and local entities.

III. Five Strategic Goals to Meet National Water Resources Challenges

The national water resources challenges call for a sustainable future where water is managed wisely as a precious public resource.

OUR VISION is to contribute to the sustainability of our Nation's water and related land resources in ways that achieve important results:

- **Preserve, protect, and restore ecosystem health**
- **Promote economic vitality**
- **Protect and promote quality of life**

This vision points toward collaborative planning and decision-making processes among Federal, state, and local agencies through watershed-scale planning and integrated management of core water functions to restore environmental degradation, reduce human and physical losses from disasters, and develop our water resources for future generations. To achieve our vision, we must maintain our core technical competency to engineer water resources solutions for the Nation and to operate water resources infrastructure efficiently. To work toward our vision, we are setting **five strategic goals**. Each goal orients us toward meeting the key water resources challenges that we have identified:

Goal 1: Provide sustainable development and integrated management of the Nation's water resources.

We will ***be a facilitator of a systems approach to integrated water management*** to design water solutions ***with and for others*** that balance economic, environmental, and social goals for the Nation in concert with State and local entities, and Tribal Nations. We will apply environmental, watershed, and sustainable design principles promoting sustainable development to address competing water resources demands. We will use systems thinking and systems tools to identify a broad range of relevant objectives and a robust set of alternative strategies and solutions. Our systems perspective and research and development will facilitate the ability to design more integrated approaches and solutions. We will offer to bring multiple stakeholders to a common table to facilitate a shared vision of more integrated water resources management among them. A systems approach can help the Corps serve as a key sediment manager and coastal engineer for the Nation.

Goal 2: Repair past environmental degradation and prevent future environmental losses.

We will ***be an environmental steward*** to protect and sustain ecosystem resources on public lands and waters. We will use our environmental engineering expertise to restore past environmental degradation within environmental, watershed, and coastal zone management frameworks. The watershed perspective can foster thinking about large ecosystem restoration on the order of the Everglades program. We will apply our Environmental Operating Principles to prevent unnecessary loss of environmental resources or will compensate with sufficient mitigation where feasible, authorized, and funded.

Goal 3: Ensure that projects perform in a manner to meet authorized purposes and evolving conditions.

We will ***be a Federal water resources leader*** in assuring that navigation, flood damage reduction, environmental, recreation, hydropower, and water supply infrastructure delivers levels of service to justified project levels and commitments made to customers and local sponsors within available funds. We will apply quality controls, best practices, and adaptive management approaches to find levels of service that maintain effectiveness and efficiency in ways that are responsive to changing demands.

Goal 4: Reduce vulnerabilities, risks, and losses to the Nation and the Army from natural and man-made disasters, including terrorism.

We will ***be a world-class emergency manager*** who provides timely, effective, and efficient all-hazards disaster preparedness, response, recovery, and mitigation services on a worldwide basis. We will prepare by anticipating threats, by developing risk management tools through state-of-the-art training and equipment, and by collaborating with state and local emergency management personnel through advance planning and joint training exercises. We will respond within a consequence management framework. We will recover within the context of long-term mitigation planning. We will assure that water resources infrastructure remains safe and secure for stable performance.

Goal 5: Be a world-class public engineering organization.

We will ***provide expert technical assistance*** to the Army, Department of Defense, other Federal agencies, the Nation, and internationally as authorized by maintaining a solid technical foundation in our core competency base. We will recruit, develop, and retain a versatile and respected engineering-related work

force. We will provide civil works tools, technology, and expertise to others on a reimbursable basis without decrementing the accomplishment of civil missions. We will manage our program resources with a sense of responsibility and an eye toward accountability, linking performance results with our budget and our budget with our performance expectations. We will develop and apply state-of-the art technologies, methodologies, and processes to enhance our work and that of others.

IV. Strategies for Achieving Our Goals

Our strategic goals indicate what we will do to address critical national water resources challenges. Our strategies suggest how we will move in this direction.

Overarching Strategies

- **Modernize Decision-Making Processes**

The relevance of any Federal program to the Nation is grounded in the ability to address fundamental problems and opportunities within assigned missions and resources. The discussion of water resources problems, demands, and opportunities facing our Nation suggests that we must be alert to events, trends, issues, technologies, and the sentiment of the general public, experts, our stakeholders, and Congress so as to formulate and revise plans for accomplishing our missions in a responsive manner. Our decision-making approach will **become more proactive through anticipatory planning that involves scouting water demands and opportunities within a larger framework that considers national and regional water resources requirements for national, regional, and local benefits**. Anticipating water resources requirements will enable us to forecast problems and opportunities to **seek a coherent Federal water policy**; to **facilitate ongoing research** to position us wisely for the future; and to enhance understanding of options, tradeoffs, and consequences involved in water resources decision making in partnership with others who share our concerns. Toward this end, we will **improve our decision-making processes** so that they allow us to better anticipate demands, search for multiple and creative options, develop and import state-of-the-art technologies, and apply sound science to the evaluation of our solution options. **We will promote technology transfer** of analytical and decision-making methodologies. A fundamental reform will involve the process by which we determine water resources project requirements and justify options for addressing these demands. Specifically, we will **improve our project planning processes to better balance economic and environmental goals in project development**. We will avail the **project management business process** as a foundation approach to organizing teams and monitoring work.

- **Adopt Integrated Approaches**

Integrated water resource management is key to balancing, combining, and

managing the tension of disparate water resource demands, objectives, and priorities. Multi-purpose, multi-objective projects are likely to be required. Problems increasingly warrant approaches and solutions that cut across institutional boundaries and our single-purpose Business Programs. Affordable infrastructure initiatives at all levels of government are likely to require the kind of cost-effective comprehensive planning in which the Corps has traditionally excelled. We will **model systems thinking**. Environmental restoration will become an increasingly important budgetary priority as the Nation strives to compensate for the adverse effects of past unregulated economic development. **An ecosystems perspective** can balance traditional and environmental mission emphases. We will seek balance among competing demands and objectives through **watershed approaches**, by assisting state and local governments in **regional planning**, by infusing an environmental ethic into all mission areas and engineering functions, through **multidisciplinary teams**, and by developing and using **holistic methodologies**. A watershed framework unites technical experts, stakeholders, and decision-makers in seeking balanced and **comprehensive approaches** and options for addressing competing resource demands, opportunities, conflicts, and trade-offs; it also is a way to unify ongoing efforts and to leverage scarce resources. This strategy will enable us **to develop and adopt systems models and tools**; to **seek integration**; to apply **interdisciplinary methods and views**; and to **pursue and clarify overlaps and interdependencies**.

- **Align Resources and Capabilities**

Just as mission-related systems and technology must reflect the most modern perspectives and approaches, so too must our support systems enable mission accomplishment. We strive to invest in our capabilities, to apply our capabilities where they will have the most impact, and to preserve our core capabilities for mission execution. We will provide timely, continual, and sufficient **updating of policies and guidelines and recruitment and retention policies**. We will **use performance management approaches and performance benchmarks**. **Project management** will continue to be the Corps' major business process to bring control and alignment to processes and standards ensuring the delivery of quality products and services to valued partners and customers. **Knowledge management** strategies and **information management technologies** will furnish stability, operational strength, and connectivity. Budget-performance links will move us in this direction.

- **Build Productive Partnerships**

There is a growing need for **collaboration** in solving resources problems across all levels of government and between governmental and non-governmental entities. Forums, management processes, and emphases should be more intergovernmental in nature, recognizing a stronger non-Federal role, regional approaches, and growing capabilities at state and local levels. **Non-governmental organizations** (non-profit and private-sector companies, associations, and organizations) and **Tribal Nations** share goals and values regarding water resources and should be considered assets and partners in educating the general public, water resources stakeholders, public officials and key decision makers, and future generations about water resources challenges and options. Our strategies will be to **promote strategic partnerships** with others in developing analytical and decision-making techniques; to **listen with an open mind** to our stakeholders, partners, customers and critics; to encourage **joint planning**; to develop **multiple methods** and materials for **communicating the water resources story** to a variety of audiences; to **foster public-private partnerships**; and to get our shared **messages out more consistently, reliably, and accurately. We cannot do the Nation's water resources development and management work alone.**

The President's Management Agenda

We perform our roles in the context of five management initiatives directed by the President. These initiatives orient our management strategies for organizational effectiveness. These strategies are described below.

- **Integrate the Budget and Performance**

Under the Government and Performance Act of 1993, program goals are supposed to be linked to program budgets. Therefore, integration of performance and budget data becomes an aim of good government and a fundamental aspect of this entire strategic plan. The key is to integrate output and outcome performance information in budget requests that support resource levels required for effectiveness. Our annual Program Memorandum and Annual Performance Plan indicate how we intend to request a budget to direct our performance toward our strategic goals in specific ways.

- **Expand Electronic Government (E-Government)**

With the advent of technology and a desire to be more citizen-centered and efficient, there are opportunities to expand the use of electronic media to

improve business processes and internal and external communications. The Civil Works Program has several information technology (IT) systems and projects that are part of its IT backbone. Processes pursuant to becoming more government friendly, efficient, and effective involve preparation of business cases per OMB Circular A-11 for information technology (IT) investment. The Corps has committed to develop an acceptable Capital Planning and Investment Control Plan (CPIC) and Corps Enterprise Architecture (CEA) (a web-based repository of information that facilitates four views: business, information, applications, and technology). A plan for all of our E-Government Initiatives was submitted under separate cover to OMB on September 9, 2002.

- **Manage Human Capital Strategically**

This initiative is essential to develop world-class technical expertise. We will align our strategies for recruiting and sustaining a workforce with organizational missions and goals and high standards of productivity. We will ensure that mission-critical occupations are filled with sufficient quantity and talent of skilled personnel. We will implement an incentive structure conducive to high performance. Our Human Capital Strategy will outline how we intend to meet future mission requirements. A separate plan will be submitted to OMB by the end of September.

- **Compete Inherently Non-Governmental Work**

The Corps currently contracts out about 60 percent of its work. The Administration aims for us to become even more market driven. The Office of Management and Budget has set a goal to identify inherently non-governmental positions subject to competitive sourcing; agencies are to have a competitive sourcing management plan (template) by September, 2002. By the end of Fiscal Year 2003, the Corps is to have competed 15 percent of reviewable positions as a prelude to the target of competing 50 percent of all commercial activities. A combined Human Capital Strategy and Competitive Sourcing and Management Plan was submitted to OMB on September 9, 2002.

- **Improve Financial Performance**

Delivery of desired program results for our authorized missions to our customers and American taxpayers is certified through sound financial performance. An unqualified audit opinion in auditing the CFO Report –our Civil Works Program financial statement –certifies sound financial management. We aim for an unqualified opinion on every financial statement we produce.

V. Strategic Objectives

Our five strategic goals suggest specific strategic objectives, as Table 3 summarizes. These 13 strategic objectives clarify our intent to achieve our vision. Each objective is illustrated by initiatives we intend to take to accomplish it.

Table 3. Civil Works Program Strategic Goals and Objectives

Our Vision : Contribute to the sustainability of our Nation's water and related land resources in ways that achieve important <u>results</u>: • **Preserve, protect and restore ecosystem health** • **Promote economic vitality** • **Protect and promote quality of life**				
5 Strategic Goals				
Goal #1 **Sustainability and Integration** **Provide sustainable development and integrated management of the Nation's water resources.**	**Goal #2** **Environmental Restoration** **Repair past environmental degradation and prevent future environmental losses.**	**Goal #3** **Project Performance and Quality** **Ensure that projects perform in a manner to meet authorized purposes and evolving conditions.**	**Goal #4** **Emergency Management** **Reduce vulnerabilities and losses to the Nation and the Army from natural and man-made disasters, including terrorism.**	**Goal #5** **Technical Competency** **Be a world-class public engineering organization.**

13 Strategic Objectives				
1.1 Seek water resources solutions that better balance economic, environmental, and quality of life goals. 1.2 **Support the formulation of regional and watershed water resources solutions to water resources problems**.	**2.1 Identify and restore ecosystems degraded by past development.** **2.2 Assure zero net-loss of wetlands.** 2.3 **We will assist other agencies in the cleanup of contaminated hazardous, toxic, and radioactive waste (HTRW) sties as authorized to the best of our capabilities.** .	**3.1 Improve the efficiency of Corps water resources projects.** 3.2 **Improve the effectiveness of Corps water resources projects in adaptive ways.**	**4.1 Prepare and provide for rapid, efficient, and effective all-hazards response and recovery.** 4.2 **Improve and maintain the safety and security of critical infrastructure.** 4.3 **Leverage Civil Works assets to support the Army and strengthen homeland security.**	**5.1 Be a world-class technical leader.** 5.2 **Improve financial performance.** 5.3 **Become a more citizen-centered, effective, and efficient organization.**

STRATEGIC GOAL #1: Provide sustainable development and integrated management of the Nation's water resources.

STRATEGIC OBJECTIVE 1.1. Seek water resources solutions that better balance economic, environmental, and quality of life goals.

<u>Initiative 1.1.a.</u> We will seek authorities and policy and procedural reforms that better align existing Civil Works programs and activities with watershed thinking and that increase meaningful balance among

economic, environmental, and social goals in delivering water resources solutions.

Sub-initiative 1.1.a-1. We will review our policies to determine those that promote and inhibit integrated water resources management. This review will identity process and policy restrictions that add no value and will recommend changes to better align our policies, procedures, and processes with our strategic intent to foster integrated water management.

Sub-Initiative 1.1.a-2. We will promulgate guidance that fosters environmental sustainability. We are issuing policy on how to formulate and evaluate Corps of Engineers Civil Works projects that contribute to environmental sustainability in order to achieve greater balance between economic and environmental considerations throughout the life cycle of project planning, design, construction, operation, and maintenance. Corps projects can be planned to achieve a balance between these objectives through multi-purpose plans that produce both national economic development (NED) outputs and national ecosystem restoration (NER) outputs. This policy will encourage development of alternative plans that generate both economic and environmental benefits during the planning process in collaboration with all appropriate parties and stakeholders. In instances where an NED-only plan is formulated, plans should include innovative measures and technologies that avoid or minimize adverse environmental impacts, thus reducing the need for compensatory mitigation. Formulating an NED plan with minimal ecosystem restoration features should be used as a last resort when no other approach is applicable.

Sub-Initiative 1.1.a-3. We will make internal improvements to our business policies and processes. The Chief of Engineers testified to Congress on June 18, 2002 that he intend to make three fundamental changes to transform the Corps: reduce the backlog of projects, improve internal processes, and work toward watershed approaches. There are other steps that the Corps is taking. For example, we will use nationally accepted economic models to a greater degree. We will improve post-authorization policies and practices. The Corps is the lead agency in project pre-authorization planning and post-authorization implementation. We can be as specific about post-authorization policies and business practices as we are about pre-authorization policies and processes. It may be advisable to develop separate policies and practices for watershed-level work that draw on the strengths of project-level policies and processes but that are capable of addressing unique watershed-level requirements for balance across economic, environmental, and social goals and integration of efforts across functional areas (planning, engineering, operations, regulatory), Federal agencies, and levels of government. We may

explore adjusting our core business process -- the Project Management Business Process (PMBP) -- to encourage watershed-level thinking. As now oriented, the PMBP favors a project-level view, which sometimes optimizes the local benefits to the project at the expense of the surrounding region. The reporting processes related to the reconnaissance-to-feasibility stages of project development do not seem to fit watershed-scale planning and may need to be revised.

Sub-Initiative 1.1.a-4. We will look at our internal review function within the Corps for complex planning studies. Throughout the course of the past decade, the Corps has been constantly striving to improve its internal processes to better serve the Nation and it's water resources needs. The Corps' project formulation and development process is a well-documented process that is founded in the Principles and Guidelines under which the Federal Government operates. We will work with Congress, the Administration, and other interested parties in improving our study process. It is incumbent upon us to ensure that projects are sound national investments that reflect appropriate responses to national requirements. In the meantime, the Corps is focusing internally on improving its planning and review capability by emphasizing training, state-of-the-art modeling, and enhanced regional planning capability. We will continue to draw upon the benefit of partnerships within our Federal family to facilitate independent review, such as the Principals Group working to advise us on the Upper Mississippi Navigation Study.

Sub-Initiative 1.1.a-5. We will explore providing guidance to encourage our Districts to develop reconnaissance studies at a broader scale. The limit of $100,000 for a reconnaissance study that we have imposed is probably keeping the scope of our projects too narrowly defined as local benefits. Expanding this limit to $250,000-$500,000 may afford greater opportunity for examining watershed requirements more comprehensively.

Sub-Initiative 1.1.a-6. We will seek to strengthen the ability of Section 202 of WRDA 2000 to address water resource challenges and opportunities in a watershed or region. The current arrangement for cost sharing encourages local project benefits and discourages watershed-scale benefits. Increased study cost-sharing requirements have tended to shift the focus from comprehensive water resources planning to assembly-line project planning that focuses on the wants of the cost-sharing partner, often to the neglect of the watershed. Non-Federal interests who are willing to cost-share watershed studies are pragmatically bound to support local perspectives and goals for watershed management. As the National Academy of Science pointed out, with non-Federal contributions come inevitable expectations to influence the direction and scope of a study. Decreased research funding levels and an

emphasis on localized issues tend to curtail advances in technology essential to a systems approach to problem solving and emphasize investments for short-term benefits. We need to explore incentives to foster watershed work to gain benefits beyond the local project level; this may involve examining the current cost-sharing arrangement. We will explore interest expressed by states to sponsor watershed-scale planning studies.

Sub-Initiative 1.1.a-7. We will seek reforms that enhance the ability to obtain watershed-level benefits. We will seek clear authority and funding to enhance the ability of the Corps to collaborate with other agencies in watershed initiatives. We many need to seek authorization and funding for regional watershed teams to ensure integration and collaboration among Federal and non-Federal agencies within regional watersheds. To ensure that the work does not focus on the interests of one community in a region, 100 percent Federal funding may be required; this is not to be viewed as a reconnaissance study. The legislation would establish participatory procedures that promote inclusion of individuals and non-governmental organizations in watershed resource planning and management decisions. The Corps has developed sophisticated methods of participatory water management for resolving conflicts in river basins where we have constructed projects. This approach would allow the Corps to produce a model approach based on "lessons" learned from these collaborative efforts and share these lessons to reinforce our being a learning organization. As a learning organization, we will examine several large-scale projects now ongoing, e.g., the Comprehensive Everglades Restoration Program, Coastal Louisiana 2050, Central Valley of California, Upper Mississippi River Study, and Missouri River Master Plan to draw lessons learned from them regarding policies, practices, and business processes that promote or detract from watershed-scale work.

Initiative 1.1.b. We will invest in research and development (R&D) strategically to develop and field analytical tools and methods that facilitate achieving sustainable development and integrated water resources management. It is incumbent upon us to develop state-of-the-art economic, environmental, and quality of life analytical tools and methods for conducting trade-off analyses to better balance multiple objectives. In addition to developing a strong R&D program to support problem solving and operational improvements related to navigation systems, flood and coastal protection, environmental technologies, infrastructure engineering, geospatial technologies, integrated technologies for decision making, and Civil Works project security and protection, we will place greater attention on producing frameworks, methodologies, and technologies fostering integration, a systems approach, trade-off analysis across multiple objectives, modeling (e.g., economic, simulation, multi-attribute), and enhanced management of risk and uncertainty.

A Common Delivery Framework supports this perspective. We are recommending that several strategic R&D programs have funding priority.

Two examples provide illustrations. Our System-wide Modeling, Assessment, and Restoration Technologies (SMART) Program is working toward watershed and ecosystem scales to assemble and integrate the varied components of quantitative ecology, to transcend basic research, and to connect and apply current and improved approaches for predicting ecological responses over a variety of scales, from individual projects to regional (basin/system-wide) scales, to facilitate decision making regarding multiple resources and objectives. This program will develop the Corps' capability to communicate forecasts of the impacts of human activities on environmental conditions across planning, construction, and operations and maintenance activities to stakeholders and decision makers, thus moving us toward greater environmental sustainability. The SMART program will integrate the Corps Water Management System, the Regional Sediment Management Program, the Geospatial Program, the Ecosystem Management and Restoration Research Program, and the Information and Management Decision Methodologies Program. Coordination across entities within the Corps and externally with other Federal agencies (e.g., U.S. Department of Agriculture's Natural Resources Conservation Service, Agriculture Research Service, and Forest Service; Bureau of Land Management; Bureau of Reclamation; U.S. Environmental Protection Agency's Office of Water and Office of Research and Development; and the U.S. Geological Survey), state conservation entities, and national institutes and centers (e.g., National Water Management Center, Watershed Sciences Institute, Wildlife Habitat Management Institute, National Water and Climate Center, Grazing Lands Technology Institute) will be critical to this endeavor.

In an effort to restore confidence in the Corps economic analysis among our stakeholders, our Navigation Economics Technologies (NETS) initiative aims to standardize evaluation tools and methods for conducting navigation project life-cycle analyses and for developing field tools incorporating state-of-the-art economic evaluation methods to improve decision making regarding economic effects of navigation alternatives while considering demand elasticity associated with uncertainty. NETS will facilitate estimations of navigation services, an analysis of port and waterway development, and a standardized approach to multi-port and multi-project systems analyses. The intended multiple benefits are to reduce life-cycle operations and maintenance costs, to improve levels of service, to maximize traffic throughputs, to improve construction methods and lower associated costs, to enhance the environment, and to promote military readiness.

Initiative 1.1.c. We will encourage greater integration across our Civil Works Business Programs in their program planning. For example, our Regional Sediment Management Program already integrates **environmental** goals with **navigation** goals to find environmentally beneficial uses for dredged material that can result in reduced shore-protection and flood and storm damage recovery costs. We can better align our **planning** and **regulatory** functions so that our regulatory expertise is used to assist with the Clean Water Act's 404-b-1 analysis and so that our planning function assists with environmental impact statements. We have initiated a policy study on planning to improve regulatory decisions by comparing decision-making processes in the Corps planning and regulatory programs to determine how each could benefit from the other for project decision-making within a common framework of managing natural resources. In many Districts, we have co-located our Regulatory and Operations personnel at project offices to improve the efficient regulatory permitting and real estate reviews of development on or near Corps land. We aim to integrate our **Flood Damage Reduction** Program with our **Emergency Management** Program to provide planning assistance to states to develop mitigation plans for communities – especially those most likely to be affected adversely by storms and floods -- that can help them recover from a flood in a more sustainable manner so as to better address economic, environmental, and social aspects during recovery efforts.

Initiative 1.1.d. We will use information technology and communications media to enhance the public's understanding about the value to the Nation of the products and services we deliver and alternatives for addressing water resources challenges. Several E-Government initiatives are supporting our efforts to work more collaboratively and holistically. For example, the National Resources Management Gateway provides a one-stop gateway to topics of interest to Corps teams executing the Natural Resources Management mission. It supports "communities of practice" by providing information for "knowledge management" within the Natural Resources arena.

Initiative 1.1.e. We will increase our use of collaborative approaches to water resources problem solving. We will develop and apply consensus-building and collaborative problem solving processes to increase our capability to engage our stakeholders and the public in a fruitful dialogue about national water resources requirements and appropriate responses to them. In this vein, we have re-instituted Public Involvement Training throughout the Corps to better enable our planners and those involved in outreach and project formulation to initiate and contribute to meaningful water resource needs assessments, solution options, and implementation approaches. Our *Shared Vision Planning Process*, which fosters multi-objective planning and analysis through simulation

modeling, is showing promise as a way to bring all key stakeholders to the same table early in the planning process to compensate for the fragmented approach to water supply planning. Our current experience with the Rappahannock River Basin Commission is showing the potential to draft a common model agreed upon by all (decision makers, water experts, farmers, commercial fisheries and developers, primary utilities, environmental groups, Indian reservations, recreation users, watershed groups, planners, regulators, and homeowners' groups) in a demonstration project to create a vision for regional water supply planning in the Rappahannock River Basin through 2050.

Initiative 1.1.f. As a result of the above initiatives, **by the end of Fiscal Year 2003, we will develop one or more appropriate performance measures to gauge our success in promoting integrated water resources management and greater balance across environmental, economic, and social goals in providing the Nation with viable water resources solutions for a sustainable future.**

STRATEGIC OBJECTIVE 1.2. Support the formulation of regional and watershed solutions to water resources problems. We will work collaboratively with state and local entities to develop water resources options and solutions at a watershed scale. Perhaps it is time to initiate a national water assessment that specifies regional opportunities for watershed planning and management. The initiatives below describe how we will work toward regional and watershed planning and problem solving.

Initiative 1.2.a. We will utilize our existing comprehensive authorities to promote comprehensive, holistic, and integrated regional water resources plans. For example, Section 202 of WRDA 2000 authorizes us to assess the water resources requirements of river basins and watersheds of the U.S. Section 729 of WRDA 1986 provides authority to study water resources requirements of river basins and regions. Section 503 of WRDA 1996 allows us to provide technical, planning, and design assistance to non-Federal interests for carrying our watershed management, restoration, and development projects, including management and restoration of water quality; control and remediation of toxic sediments; restoration of degraded streams, rivers, wetlands, and other water bodies as a means to control flooding, excessive erosion, and sedimentation; protection and restoration of watersheds (including urban watersheds), and demonstration of technologies for nonstructural measures to reduce destructive impacts of flooding. Section 212 of WRDA 1999 provides authority to construct projects to reduce flood hazards and restore the natural functions and values of U.S. rivers. Our ability to develop project opportunities at a regional or watershed scale is complicated by the difficulty of achieving consensus and collaboration across multiple stakeholders and the cost-sharing

provisions of the current law. Non-Federal interests who are willing to cost-share watershed studies are often constrained by localized goals for watershed management, making it difficult to sustain independent determinations of Federal interest in pre-authorization studies. We will continue to work with all interested parties to seek broad-based water resources solutions.

Issues related to water supply and drought management provide opportunities for regional planning, but the lack of an updated national water assessment makes it difficult to initiate regional planning. Currently, there is no Federal champion to take the lead. In the absence of a Federal champion (focal point), states are stepping up to the challenge. For example, California has initiated the California Coastal Sediment Master Plan, a state-wide effort to leverage support and funds for a comprehensive sediment management plan for the entire California coastline; it examines the California coastline as a system of sand and sediment from the headwaters to off-water disposal sites or sinks. We can help states, such as California, through our technical assistance to leverage all authorities and programs relevant to regional sediment management, including general authorities that support watershed, comprehensive, and systems approaches (e.g., Sections 107, 202, 227(d), and 516), authorities specific to projects, sand, and dredged material management (e.g., Sections 14, 103, 111, 145, 204, 206, 207, 216, 217, 933, and 1135), ongoing research efforts (e.g., the Coastal Field Data Collection Program's Southern California Beach Processes Study), as well as specific feasibility studies for shore protection projects.

Initiative 1.2.b. We will adopt and promote systems approaches that seek balance across economic, environmental, and social goals for water resources solutions. It is increasingly clear that water management requires holistic and integrated planning. A systems approach to watershed planning and integrated water resources affords this. A systems approach defines a "problemshed" so as to identify all ecosystem resources within a watershed and all stakeholders with an interest in using these resources. A systems approach permits better examination of potential economic, environmental, and social outcomes, builds the relationships to work through conflicts regarding competing uses of water, strives for balanced benefits, and seeks workable compromises. Comprehensive studies, such as the Comprehensive Everglades Restoration Program and the Sacramento and San Joaquin River Basins Comprehensive Study are examples of efforts seeking system-wide water resources solutions.

Sub-Initiative 1.2.b-1. We will initiate a campaign to educate our employees about the value of taking a systems approach, highlighting how expected benefits compare to the outcomes gained from individual single

purpose projects. They must be convinced of the merits of a systems approach and comprehensive solutions.

Sub-Initiative 1.2.b-2. We will initiate a campaign to educate our external stakeholders – particularly potential local sponsors – about the value of taking a systems approach, highlighting how expected benefits compare to the outcomes gained from individual single purpose projects. They must be convinced of the merits of a systems approach and comprehensive solutions to endorse broad-based solutions that also achieve local goals.

Initiative 1.2.c. We will foster inter-agency and stakeholder collaboration through strategic partnerships with other Federal agencies (e.g., the Departments of the Interior and its Bureaus, Agriculture (particularly the Forest Service and Natural Resources Conservation Service), Commerce, and Transportation, as well as the Environmental Protection and Federal Emergency Management Agencies**), interstate, state, local government, and tribal entities, and non-governmental entities and a common systems view to move toward shared understanding of integrated solutions to water resources management within watersheds and river basins.** We recently signed a Memorandum of Understanding (MOU) with the Nature Conservancy to improve the management of dams on various U.S. rivers and with Ducks Unlimited to work collaboratively toward preserving the diversity of plant and animal life and natural communities that inhabit the planet.

We will form working groups, sponsor symposia, and engage in information exchanges with relevant water resources entities. We will continue broad policy discussions with our sister agencies beyond the September 2002 National Water Policy Dialogue through meetings, working groups, and symposia to clarify the Federal role in water resources management, to align Federal water-related policies.

We will play our part in promoting the objectives of broad-based efforts such as the Comprehensive Everglades Restoration Program and the Coastal Louisiana 2050 initiative.

In those situations where authorities conflict across agencies, we will work to better align our programs.

We will continue our participation on councils and steering groups, such as the Federal Executive Watershed Steering Committee, interagency roundtables, and the Federal Water Resources Research Coordinating Committee to work with others toward shared goals. We will seek ways to promote stakeholder involvement earlier in our project development process and

will work with principals' groups, such as the interagency Washington-level Principals' Group (including the Fish and Wildlife Service, EPA, Department of Commerce's National Marine Fisheries Service and USDA's Natural Resources Conservation Service) we established to provide the national policy perspective and oversight regarding proposed navigation improvements on the Upper Mississippi River study; it provides a model for other multi-objective watershed studies and studies of national significance, such as Coastal Louisiana 2050.

We will seek the wise counsel of experts and stakeholders who serve on advisory boards, such as the Transportation Research Board, the Environmental Advisory Board, and the Coastal Engineering Research Board, in formulating opportunities for comprehensive and multi-objective solutions to pressing water resources demands.

Initiative 1.2.d. We will develop and apply systems technologies to facilitate watershed planning and integrated water resources management. Our geospatial capability provides an example of E-Government that facilitates a systems view. The Corps is taking the lead to provide data for inland waterways through maps of navigation channels and automated information systems related to shoreline and inland navigation waterways in partnership with the Coast Guard, the National Oceanic Atmospheric Agency, and the River Boat Pilot Association under the Inland Electronic Navigation Chart (IENC) Program. This program provides a geospatial one-stop source for marine transportation. Additionally, the CorpsMap Program will provide one geospatial interface for all national-level databases; it will allow any Federal agency to incorporate Corps data into their own viewing tools. The Corps has established a clearinghouse node for national spatial data infrastructure under the Geospatial Data Accessibility Program. This node includes contract language to permit contracts that are being executed for the purpose of collecting geospatial data to be included in metadata files.

Another example of integration is the Corps Water Management System (CWMS), a real-time water control decision support system. The Corps is responsible for round-the-clock monitoring and operation of more than 700 reservoirs, locks, dams, and other water control projects under our control. During flood operations, this responsibility expands to include over 120 additional projects. CWMS supports the decision process for water control management by integrating a suite of hydrologic, operations, and impact analysis models and outputs for over 700 multipurpose reservoirs, control structures, and thousands of miles of levees (once available in 40 unique systems) into a corporate web-based automated information system of real-time water resources information. This information becomes important for emergency planning and response (e.g., time estimates for when flood impacts will occur),

project evaluation (e.g., placement, sizing, and regulation of new projects or changes to existing projects), post-flood event project performance (damages and benefits, future improvements), and floodplain studies.

STRATEGIC GOAL #2: Repair past environmental degradation and prevent future environmental losses.

STRATEGIC OBJECTIVE 2.1. Identify and restore ecosystems degraded by past development. Working with our partners, including other Federal and state agencies, non-governmental organizations, and Native American tribes, we will seek solutions that employ good science, state-of-the-art technologies and methodologies, and creative, efficient, and effective environmental approaches. We will assure that all civil works facilities and associated project lands (including out grant areas) comply with environmental requirements contained in relevant Federal, state, and local laws and regulations.

Initiative 2.1.a. We will fully utilize our existing authorities to prioritize environmental restoration requirements to repair the environment damaged by our projects. The negative effects of past development practices are visible. We feel a special responsibility to acknowledge and to rectify — to the degree authorized and funded -- the adverse consequences of selected water infrastructure development and to promote environmental quality so that our natural resources can be sustained for future generations**.** The Chief of Engineers has revitalized the Environmental Advisory Board, a board of independent, external environmental advisors, to advise on our environmental processes. Our capabilities to make effective and efficient contributions to ecosystem restoration and other water resources development objectives will be improved through adaptive management.

Initiative 2.1.b. We will give emphasis in program development guidance to ecosystem restoration solutions. Our environmental and regulatory programs constitute 18 percent of our budget and are growing. We will fully utilize our Continuing Authority Programs, Section 22 (WRDA 1974) planning assistance to states, and other authorities to emphasize environmental benefits. The policy for environmental sustainability that we are developing will help us formulate multi-purpose plans that produce both economic and environmental benefits by more fully integrating environmental considerations throughout the life cycle of a project. Where possible, a combined NED/NER plan will be formulated. We will also encourage the option to add ecosystem restoration to a single-purpose NED plan with limited formulation amounting to 5 percent of the total project cost (up to a $1 million limit). We will implement a program management plan to integrate our Environmental Operating Principles and doctrine into all our

policies and activities, to train our employees in the Principles and doctrine, and to develop performance measures to ensure progress toward environmental goals.

Initiative 2.1.c. We will explore the role of the Corps in restoration and cleanup of urban rivers. We have signed an MOU with the EPA to clean up urban rivers contaminated by sediment and will explore the interest of large urban cities to revitalize their urban waterfronts.

Initiative 2.1.d. We will support environmental research and development that enhances definitions, frameworks, and analyses related to environmental sustainability. Currently, environmental R&D comprises 15 percent of the total Civil Works research and development budget (for General Investigations) and is planned to comprise 20 percent in the Fiscal Year 2003 budget.

Initiative 2.1.e. We will seek partnerships to promote integrated environmental management. For example, the Corps signed a partnership with the Nature Conservancy ("Sustainable Rivers Project") to collaborate on improving dam operations, helping to restore and protect the health of habitats and rivers surrounding natural areas while continuing to meet human needs for flood control and power generation, and improve the overall quality of America's waterways.

STRATEGIC OBJECTIVE 2.2. Assure zero net-loss of wetlands.

Initiative 2.2.a. In support of the national commitment to preserve wetlands **we will strive to maintain no-net-loss of wetlands and to add to the Nation's environmental resource base through restoration and enhancement projects**. We will assure that Corps mitigation outputs meet the requirements of authorizing legislation or relevant Corps decision documents. We will assist in the recovery of Federally listed species.

Initiative 2.2.b. We will assure that regulatory permits achieve their performance targets within available funds.

Initiative 2.2.c. We will improve our regulatory permit processing. We recognize that the Corps' Regulatory Program is an important and highly visible public face of the Corps. We have two key regulatory responsibilities: first, to protect the aquatic resource base in accordance with applicable laws; and equally important, to provide responsive service to those seeking permits. We pledge to ensure that mitigation requirements stipulated as conditions to permits will be complied with and that decisions on permits will be rendered in a timely fashion, always with an eye toward decreasing permit processing time

and making our process more responsive to those requesting permits. We are aware that in some cases regulatory guidance may be unclear or that applicants may have difficulty in easily getting information about the status of their permit applications. This is one area where E-Government is proving most helpful to establish a national database of regulatory information. For example, our Regulatory Program has put permit application forms on-line in most Districts and provides guidelines, summary information (e.g., general permits), the status of appeals, other pertinent information, and relevant links. In our Jacksonville District, applicants can get a copy of the permit form on-line and view the stage of Corps review for any permit action. Our Omaha and Sacramento Districts permit on-line completion of the permit form. Future efforts will involve improving guidance about Standard Operating Procedures to assure consistent permit reviews across Corps Districts.

Initiative 2.2.d. We will support the development of common performance measures for wetlands in collaboration with other Federal agencies. The Corps supports an approach to sample key regions or watersheds (using the list of watershed provided by the U.S. Fish and Wildlife Service and the Natural Resources Conservation Service) for regulatory information to compile estimates of acreages, types of wetland mitigation actions and costs, and habitat information.

STRATEGIC OBJECTIVE 2.3. Assist other agencies in the cleanup of contaminated hazardous, toxic, and radioactive waste (HTRW) sites as authorized to the best of our capabilities.

Initiative 2.3.a. The Army Corps of Engineers has been given responsibility to execute an environmental cleanup program to remediate contaminated sites under the Formerly Utilized Sites Remedial Action Program (FUSRAP). We will accomplish our remedial work on high-priority sites in a way that reduces potential risks to health and the environment, and we will take steps to **improve the overall efficiency of the FUSRAP program**.

Initiative 2.3.b. The Environmental Protection Agency has delegated the responsibility to clean up Superfund sites to the Army Corps of Engineers. We will accomplish our remedial work on high-priority sites in a way that reduces potential risks to health and the environment, and we will take steps to **improve the overall efficiency of the SUPERFUND program**.

STRATEGIC GOAL #3: Ensure that projects perform in a manner to meet authorized purposes and evolving conditions.

STRATEGIC OBJECTIVE 3.1. Improve the efficiency of Corps water resources projects.

Initiative 3.1.a. We will take concerted action to reduce the O&M backlog to expedite maintenance projects designed to raise the level of project performance. The efficiency of our projects is hampered to the degree that we are not maintaining or rehabilitating our existing water infrastructure to ensure that it delivers to specifications, at a minimum, and, preferably adaptively to meet changing requirements. Generally, deferred maintenance is not cost-effective in the long-term because it requires greater expenditures for repairs.

Initiative 3.1.b. We will make process improvements in our Civil Works Business Programs: Navigation, Flood Damage Reduction, Environment, Hydropower, Water Supply, Recreation.

Sub-Initiative 3.1.b-1. We seek to maintain our quality assurance and quality control by improving policies, processes, guidance, standards, and capabilities related to the formulation, operations, maintenance, and evaluation of our projects.

Sub-Initiative 3.1.b-2. We seek to improve the operations and levels of service of our Navigation, Flood Damage Reduction, Hydropower, Recreation, and Environmental Stewardship Business Programs. We will examine maintenance costs to assess ways to reduce operational breakdowns and the adverse impacts of "downtime." We will utilize electronic technology to the fullest. For example, we will improve upon the Operations and Maintenance Business Information Link (OMBIL) – an electronic system that provides operational data pertinent to the specific civil works projects and Business Programs. Efforts are underway to expand OMBIL beyond the Operations community in the Corps to serve as a more generic performance management tool. Using OMBIL data, we are developing a central web site for Corps notices to Navigation interests in support of the navigation industry.

Sub-Initiative 3.1.b-3. To improve the efficiency of project development and execution, we will implement the Project Management Business Process (PMBP) at our Headquarters through Civil Works Project Management Business Process Teams to support field project delivery

teams. We have established and co-located eight standing teams to provide seamless support to our eight MSCs with respect to all matters associated with Corps projects within the MSC, including all MSC correspondence concerning pre-authorization, authorization, appropriations, execution, inquiries, budget, WRDA matters, and coordination of PCA documentation for approval by the Assistant Secretary of the Army for Civil Works. These interdisciplinary teams, comprised of the Headquarters Civil Works Area Manager, Planning Manager, and a permanent member from the Real Estate, Counsel, Engineering and Construction, and Operations organizations, will provide cradle-to-grave management support and expedite teaming at the Headquarters level. Thus, PMBP will be used to achieve both vertical and horizontal teaming. A particular advantage will be to involve Operations early in the project development cycle. Another way in which we will integrate PMBP into our Headquarters operations is to align our authorization and appropriations legislative objectives better.

Sub-Initiative 3.1.b-4. We will develop a corporate strategy, policy, and implementation plan for the life-cycle acquisition, delivery, maintenance, and sustainment of the Corps of Engineers computer-based technologies (e.g., software, guidance, databases) that support science and engineering applications for Corps mission areas. The program, "Strategy for Managing Science and Engineering Technology (SET)," will facilitate technology implementation in support of project delivery teams and the PMBP. An example of E-Government and an initiative of the U.S. Army Corps of Engineers' Command Council Technology Committee, SET will structure investments to obtain step increases in efficiency and effectiveness in science and engineering activities across the Corps – thus also serving to improve our financial management.

STRATEGIC OBJECTIVE 3.2. Improve the effectiveness of Corps water resources projects in adaptive ways.

Initiative 3.2.a. A first order of business is to **reduce our construction backlog** so as to put in place projects authorized to address national water resources demands. We believe that we should take inactive projects off the books and will work to craft a practical provision to accelerate deauthorization of inactive projects.

Initiative 3.2.b. We will avail processes, such as Adaptive Management, to provide continual review and improvement of our projects. For example, the Sustainable Rivers Project partnership between the Corps and the Nature Conservancy will design and implement an adaptive water management plan that incorporates the need for ongoing assessment and revision.

Initiative 3.2.c. We will continue to fund and use E-Government efforts that directly support the effectiveness of our programs. For example, **recreation** users have access to a national on-line public lands/facilities reservation system through the National Recreation Reservation System developed in partnership with the U.S. Forest Service with the aid of Ticketmaster. Reservations can be made through the Internet, a call center, or via walk-in. Navigation interests of the marine transportation system have access to current water transportation information. The Corps has the Federal responsibility for establishing and maintaining a variety of U.S. water transportation information systems. These include databases and statistics pertaining to waterborne commodity and vessel movements, domestic commercial vessel characteristics, port and waterway facilities, lock facilities, lock operations, and navigation dredging projects. All public data are available through the NDC website, www.iwr.usace.army.mil/ndc, the Corps' single gateway to U.S. water transportation information. Within the Corps' Emergency Management Program, the interactive ENGLink system, including the Deployable Tactical Operations System (DTOS), a national fleet of rapid response vehicles that provide self-sustaining state-of-the-art communications and automated data processing equipment, directly supports emergency operations command and control. The DTOS supports command and control of both civil and military contingency and emergency operations. It is designed to provide real-time, ground-truth information and to enable distributed, collaborative planning among widely dispersed assets.

Initiative 3.2.d. We will examine best practices related to our Civil Works Business Programs and will define levels of service according to recognized industry or scientific standards. We have already initiated a project to better define desired levels of service for every Corps project to determine the least-cost options for providing desired service (performance) levels, which may have implications for setting goals regarding operations and maintenance (O&M) funding. This effort involves obtaining both quantitative and meaningful qualitative data. A Corps team is currently exploring approaches to couple Corps customer expectations to levels of service – beginning with navigation project and taking into consideration how other Federal, state, and regional agencies analyze levels of service. The methodology for the Navigation Program will be expanded to other Civil Works Business Programs.

Initiative 3.2.e. We will obtain measures of customer satisfaction for services directly provided to user groups or in support of other agencies. For instance, we will solicit customer feedback at Corps recreational sites and will obtain a measure of customer satisfaction from FEMA regarding our emergency management responsiveness to the Federal Response Plan (P.L. 84-99).

Initiative 3.2.f. We will provide facilities that meet the requirements of diverse and changing user groups and conditions. We will use adaptive management practices and customer feedback to identify areas needing modernization and rehabilitation, such as our recreational facilities.

Initiative 3.2.g. We will develop a plan to conduct post-audits to assess if projects obtain the benefits used as a basis to justify them.

Initiative 3.2.h. In line with the President's Management Initiatives, we are developing budget-linked performance measures. New measures are being developed to link the Fiscal Year 2004 budget to the Corps' Navigation, Hydropower, Flood Damage Reduction, Recreation, Regulatory, and Emergency Management Business Programs.

STRATEGIC GOAL #4: Reduce vulnerabilities and losses to the Nation and the Army from natural and man-made disasters, including terrorism.

STRATEGIC OBJECTIVE 4.1. Prepare and provide for rapid, efficient, and effective all-hazards response and recovery. We must maintain our ability to respond to and recover effectively from all types of events and hazards, from natural to technological, to man-made (terrorism). We will make optimum use of technology and the structural and process improvements begun by the Readiness 2000 initiative (April, 1998) to transform the Corps' expertise and assets into a ready corporate team. Our goal is to provide for rapid establishment of effective response organizations at all critical locations and immediate initiation of technical assistance, emergency contracting, and other critical services to impacted states and communities to lessen the impacts, losses, and hardships caused by disaster events. The terrorist attacks of September 11 shifted more emphasis toward the threat posed by terrorists with weapons of mass destruction, and the critical need for catastrophic disaster response planning, homeland security, force protection, and continuity of operations planning. These new challenges will be met, in part, by building upon the success we have achieved in responding to major disasters in the years since Hurricane Andrew.

Initiative 4.1.a. We will play a key interagency role for infrastructure response and recovery issues.

Initiative 4.1.b. We will organize our capability to prepare, respond, and recover from all hazards in line with the Federal government's proposed Department of Homeland Security. The proposed department would

incorporate FEMA and consolidate all Federal response plans and capabilities. , We will support the Office of Homeland Security and, once established, a Department of Homeland Security (DHS) in setting national policy and guidelines for state and local governments, including conducting exercises and drills in preparing for our lead Federal role for public works and engineering response to chemical, biological, radiological, and nuclear terrorism in addition to major and catastrophic natural disasters.

Initiative 4.1.c. We will develop strategic alliances through a dialogue with internal and external stakeholders in support of national readiness and homeland security.

Sub-Initiative 4.1.c-1. We will seek and maintain critical liaison relationships with the Office of Homeland Security and a Department of Homeland Security (once established).

Sub-Initiative 4.1.c-2. We will support FEMA (or its successor in a proposed Department of Homeland Security) as our customer and partner in comprehensive emergency management.

Sub-Initiative 4.1.c-3. We will develop partnerships with the American Public Works Association, National Emergency Managers Association, EPA, Department of Transportation, academia, Emergency Support Function (ESF) agencies, and other ESF leaders.

Initiative 4.1.d. We will lead an interagency initiative to develop a weapons of mass destruction comprehensive debris management guide for state and local governments, and we will develop catastrophic disaster mass housing strategy in support of FEMA and the Office of Homeland Security.

Initiative 4.1.e. We will increase the effectiveness of disaster recovery through integrated emergency management and flood damage reduction and mitigation initiatives and strategies.

Sub-Initiative 4.1.e-1. We will seek integrated life-cycle management of emergency management programs and functions (preparedness, response, recovery, and mitigation).

Sub-Initiative 4.1.e-2. We will assess Civil Works programs within the Corps that can work more holistically to provide a life cycle of emergency management (including Flood Damage Reduction, Mitigation,

Dam Safety, Response and Recovery) more conducive to risk management than currently exists. Integration of our **Flood Damage Reduction Program** and our **Emergency Management Program** will foster mitigation planning within a watershed context and the development of recovery plans within this same context. This means that recovery and mitigation efforts from national emergencies and natural disasters can be planned and carried out in ways that foster sustainability, thus saving planning resources and facilitating efficient upgrades in anticipation of contemporary and future requirements.

Sub-Initiative 4.1.e-3. We will seek the organizational structure that best supports an integrated Emergency Management and Flood Damage Reduction program.

Initiative 4.1.f. We will ensure that policy and resources sustain the Corps' emergency management capability.

Sub-Initiative 4.1.f-1. We will update policy and doctrine related to emergency management.

Sub-Initiative 4.1.f-2. We will develop performance standards in accord with the standards set by the Emergency Management Accreditation Program and National Fire Protection Association.

Sub-Initiative 4.1.f-3. We will develop a world-class capability for public works and engineering response and recovery. We will continue to recruit, train, and develop the skills and competency of Mission and Function Planning and Response Teams. We will develop a world-class cadre of ESF #3 Team Leaders and subject matter experts.

Sub-Initiative 4.1.f-4. We will improve risk management strategies and capabilities. We will seek research funds to develop and apply improved methods to assess risks and to evaluate the consequences of high-risk, high-impact events. In the current environment, it is imperative that we take precautions to the degree they are feasible and affordable. Strategies and methodologies that improve early warnings, detections, and quick response can improve decision making, particularly regarding investment decisions. The high cost of recovering from catastrophic events and weapons of mass destruction necessitate our readiness with tools and techniques that help us anticipate, evaluate, and deal with uncertainties. We will increase our capabilities through exercises – especially with first responders at state and local levels—and other emergency management personnel to increase our ability to address threats and to lessen our vulnerabilities. We will increase information exchanges to share

tools, applications, case studies, and lessons learned. The ability to consolidate Corps R&D efforts focused on critical infrastructure protection and security will enable us to prioritize and focus on homeland security and assist state and local public safety agencies and organizations in setting standards and evaluating equipment.

Initiative 4.1.g. We will improve the Evaluation and Corrective Action Program based upon lessons learned. We will improve the inspection program.

STRATEGIC OBJECTIVE 4.2. Improve and maintain the safety and security of critical infrastructure.

Initiative 4.2.a. We will develop, seek funding for, and implement plans to secure critical water resources infrastructure under Army Corps of Engineers operations and management.

Initiative 4.2.b. We will re-establish an interagency FEMA/Corps Critical Infrastructure Taskforce and Planning Group in concert with FEMA, the Office of Homeland Security, and the Department of Homeland Security (once established).

Initiative 4.2.c. We will pursue consolidating the protection of USACE critical infrastructure under one office and will align these efforts with the Homeland Security National Strategy on critical infrastructure protection. This will give us the capability to identify and assess current and future water resources-related threats against current vulnerabilities, issue timely warnings, and immediately take or effect appropriate preventative and protective action for the Corps' 300+ critical facilities. We have already completed a national prioritization of critical projects.

Initiative 4.2.d. We will integrate critical infrastructure and emergency management research and development activities for all hazards (i.e., GIS interdependency modeling, partnering with national labs).

STRATEGIC OBJECTIVE 4.3. We will leverage Civil Works assets to support the Army and strengthen homeland security. A value of having the Corps of Engineers attached to the Army is the ability to mobilize key and quality engineering-related assets in the public and private sectors in times of war or national need through in-place contracting arrangements and long-standing relationships. We will call upon Civil Works assets when appropriate and

authorized to augment the capabilities of the Army, especially in this high-threat environment, to prepare for and respond to terrorist activity and national security threats.

Initiative 4.3.1. Define and strengthen the relationship between the U.S. Army Corps of Engineers and the Office of Homeland Security and future Department of Homeland Security.

Initiative 4.3.2. Align the capabilities within the Corps to respond to homeland security requirements as they are specified by responsible military and civil authorities.

STRATEGIC GOAL #5: Be a world-class public engineering organization.

STRATEGIC OBJECTIVE 5.1. Be a world-class technical leader. The Corps of Engineers vision is to be the world's premier public engineering organization with the capability to respond to national challenges in peace and war. To do this, we must preserve our core competencies – those essential capabilities that enable us to accomplish our civil works missions for water resources stewardship, environmental protection, and national emergency preparedness, and mobilization. Providing quality and responsive engineering services to the Nation and others requires a solid foundation in a core set of technical skills grounded in planning and problem-solving capabilities related to infrastructure and water resources development and management, project management, engineering design, construction management, and real estate services. Our ability to achieve this objective is grounded in a number of on-going initiatives in support of the total Corps of Engineers Strategic Campaign Plan.

Initiative 5.1.a. Develop a Human Capital Strategy to identify and preserve core capabilities for mission accomplishment. In a separate plan – "Strategic Management of Human Capital in the U.S. Army Corps of Engineers -- we identify the minimum workforce that is required in our core organization to sustain operations to meet mission demands in conjunction with our industry partners and to make the U.S. Army Corps of Engineers the employer of choice. This plan concentrates on core competencies and essential support components needed to maintain essential functions in the face of projected retirements and their impact on critical mission occupations to avert a critical skills gap. We have evaluated the retirement wave, our capability to recruit replacement staff and redistribute workload, and attendant outsourcing implications for a realigned workforce given the Fair Act. Our human capital strategy emphasizes strategies

and actions to attract and retain a world-class workforce, to create a learning organization responsive to a rapidly changing world, and to develop leaders at all organizational levels.

Sub-Initiative 5.1.a-1. Develop marketing, recruitment, and retention strategies for series such as these where critical shortages of personnel exist. Our human capital strategy focuses on valuing and enhancing diversity; sustaining technical, management, and leadership excellence; attracting and hiring the best people available; and revitalizing entry-level and mid-level recruitment in critical skill series. These strategies are developed in the face of existing limitation and restrictions imposed by the Office of Personnel Management and Department of Defense personnel policy. We support DoD's legislative initiatives to increase flexibility and to streamline recruitment and retention processes. We are partnering with the Army staff to streamline and standardize the application process for all individuals seeking employment in the Department of the Army. Additional human capital strategies include increased strategic alignment with strategic plans and performance measures, use of outreach strategies for recruitment, leadership development, experimentation with performance awards in personnel demonstration projects, and improved use of knowledge management.

Sub-Initiative 5.1.a-2. We will take steps to develop critical competencies. Our strategies encompass both technical and leadership competencies. With respect to technical competencies, we have begun with the Planning and hydraulics and hydrology (H&H) functions and will examine other critical functions where attrition and retirements are depleting our talent reserves. For instance, we are developing a planning capability improvement program to alleviate the documented loss of planning capability. The program will include core courses, an expert planner's program, and will support attainment of a Master's degree in Water Resources Management. We anticipate conducting regional training. Revitalizing our planning capability will go a long way toward ensuring the integrity of the Chief's Report for proposed water resources projects. Our leadership initiatives include strategies to train to mission needs, to develop leaders at all levels, and to establish mentoring and coaching programs. We will promote ethical and results-oriented behavior through communication, training, accountability systems, and disclosure mechanisms.

Sub-Initiative 5.1.a-3. We will preserve the world-class capabilities inherent in our laboratories by investing and engaging in research and development activities that not only improve our operational processes but also push the state-of-the-art to address the Nation's water resources problems and opportunities in innovative and citizen-centered ways. In this respect, we will encourage collegial exchanges with experts across

our professional areas. Our ability to be a world-class public engineering organization rests on working up to recognized national and international standards, sharing lessons learned, creating a learning culture supported by appropriate training and development infrastructure, and an emphasis on continuous learning.

Sub-Initiative 5.1.a-4. We will leverage Corps technical capabilities by providing engineering-related services to DOD agencies, other Federal agencies, and authorized entities. As appropriate and consistent with current law, we will actively seek opportunities to share and extend our expertise with others through our Support to Others Program as a way to serve other national interests and to hone our skills. Overseas, the Support to Others Program affords the opportunity to promote democracy, peace, and stability in allied nations and to reduce conditions leading to conflict by assisting legitimate authorities to improve their infrastructure and environments. Other countries are seeking our assistance to enhance their public sector capacities, especially in managing and develop water for development of their economies and protection of their environments and ecosystems. In addition to supporting our Federal customers to accomplish their engineering requirements in the face of their downsized engineering capabilities, we will also form strategic partnerships with the U.S. private sector to furnish design and construction tasks conducive to maintaining a strong U.S. position in international markets in support of the President's goal to restore economic vitality.

Sub-Initiative 5.1.a-5. We will implement the SET initiative to maintain and enhance technical capability in core engineering and science competencies critical to mission accomplishment (see Initiative 3.1.b-4).

Initiative 5.1.b. We will work to compete out functions and positions that are not inherently governmental without denigrating mission accomplishment or core technical capabilities. Based upon the Commercial Activity Function Codes (CAFCs) used in the FAIR Act, 70 percent of our civil works positions are involved in core competency functions. These are scientists, engineers, park rangers, attorneys, engineering and construction control technicians, lock and dam operators, maintenance mechanics, computer specialists, program analysts, and administrative and office automation clerks. The Strategy Human Capital Plan will recommend functions (or levels of selected functions) that can be subjected to competition beyond those core competencies critical to mission accomplishment. Non-inherently governmental positions become reviewable and thus subject to competitive sourcing. Currently, 83 percent of reviewable positions have been designated commercial positions

subject to competitive sourcing. Competition plans are being developed to complete public-private competitions or direct conversion on the 15 percent of our commercial activity inventory, our target for Fiscal Year 03.

STRATEGIC OBJECTIVE 5.2. Improve financial performance.

Initiative 5.2.a. We aim to produce a Civil Works Program financial statement that will receive an unqualified opinion upon auditing. This report is a summary annual financial statement (balance sheet) and includes a summary of performance results. This will suffice as the annual. Our annual Chief Financial Officer's Report includes our annual Government Performance and Results Act Report.

Initiative 5.2.b. We will continue to reconcile issues related to obtaining an audit and an unqualified audit opinion. Unfortunately, the Corps received a qualified opinion from Army Audit Agency (AAA) on its Fiscal Year 2001 financial statement. We are actively working with the General Accounting Office (GAO) on issues cited in the Fiscal Year 2001 audit: construction in progress, accumulated depreciation, accounts payable, and system security. Unresolved issues remain regarding the original costing of property, plant, and equipment (which comprises 80 percent of the Corps' assets). The DoD IG informed us that an unqualified opinion is not likely without hiring an independent auditor and not until all old property items are fully depreciated. An unqualified opinion requires external documentation of our property values per an independent auditor. DoD is currently prohibited from delegating the authority to AAA to perform future financial audits for the Corps as AAA did in the past. Until there are sufficient funds to hire an independent auditor or legislative changes, it will be difficult for the Corps to receive an unqualified opinion.

Initiative 5.2.c. We will improve business processes and technologies related to financial management. We developed the Corps of Engineers Financial System (CEFMS) to improve our financial management. Through CEFMS, the Corps has achieved greater timeliness, accuracy, integration of information, and management decision making. CEFMS saves on paper, provides tightened internal funds control, facilitates real-time management and expedites multi-level network-based processing. CEFMS is an example of E-Government in affording electronic signatures.

STRATEGIC OBJECTIVE 5.3. Become a more citizen-centered, effective, and efficient organization.

Initiative 5.3.a. We will develop and refine a Capital Planning and Investment Plan (CPIC). Organizational effectiveness and efficiency are

supported by appropriate and functioning automated information systems. Work continues on the integrated Capital Planning and Investment Plan and accompanying plans to acquire and apply state-of-the-art business information systems.

Initiative 5.3.b. We will continue to develop business cases for major investments. Work continues on business cases for major investments. Three updated business cases from the Fiscal 2003 submission will include performance information, while eight new business cases will establish the Fiscal Year 2004 baseline.

Initiative 5.3.c. We will develop and refine a Corps Enterprise Architecture. Work continues on developing a web-based Enterprise Architecture Tool.

Initiative 5.3.d. We will develop and refine a plan for E-Government Initiatives. There are ongoing initiatives that avail both state-of-the-art and off-the-shelf electronic technologies in support of mission accomplishment, integrated water resources management, and innovation. Many of these were discussed previously in terms of specific initiatives.

Initiative 5.3.e. We will develop and refine a strategic knowledge management plan. The Corps will develop a plan to systematically provide programs and tools for knowledge sharing across the organization in support of mission accomplishment.

Summary of Goals and Objectives

Table 4 summarizes our Strategic Goals and Objectives and introduces Civil Works Business Program Goals in support of these goals and objectives. Business Program Goals become the linking pin between this strategic plan and the Annual Performance Plan, the document that allows the Corps to track progress toward the Strategic Goals and Strategic Objectives.

The table highlights four perspectives:

I. **Vision and Desired Results --** Our vision is to achieve sustainability through **important results**: *preserving, protecting, and restoring environmental health*, *promoting economic vitality*, and *protecting and promoting quality of life*. We will achieve these results in collaboration with, and support of, other Federal, state, and local entities.

II. **Strategic Goals –** We have identified Strategic Goals. Four of these goals refer to our mission authorities and are provided to position us to achieve a sustainable future; to rectify environmental damage while preventing further damage; to deliver planned levels of service through navigation, flood and coastal storm damage reduction, environmental, hydropower, and recreation activities; and to protect lives and property preventively and in response to natural and man-made disasters.

III. **Organizational Goal --** One strategic goal in particular – Goal 5 – is cross-cutting. It becomes an Organizational Goal both to facilitate and reflect the accomplishment of our four strategic mission goals. The President's Management Agenda provides guidance for setting specific Strategic Objectives to achieve this Organizational Goal.

IV. **Strategic Objectives and Business Program Goals –** The five Strategic Goals will be achieved through Strategic Objectives. Thirteen Strategic Objectives define more specifically what we plan to do to accomplish both our mission-specific and organizational Strategic Goals. These objectives are specified even more concretely in terms of identifiable Civil Works Program Business Program Goals.

The Civil Works Program Strategic Plan ends with Business Program Goals. The Annual Performance Plan – a separate document -- begins with the Business Program Goals and specifies in even more detail how goals will be achieved. The **Business Program Goals** specify results desired from core Civil Works programs, e.g., Navigation, Flood and Coastal Storm Damage Reduction, Environmental Protection, Restoration and Stewardship, etc. **Performance Measures** and **Business Program Objectives** provide detail regarding how we will meet annual **Performance Goals** (target levels of output) for each Business Program Objective. Figure 6 further elaborates on the relationship between the Strategic Plan and its components and the Performance Plan and its components.

Table 4. Summary of Goals and Objectives

Vision and Results	Contribute to the sustainability of our Nation's water and related land resources in ways that achieve important results: • Preserve, Protect, and Restore Ecosystem Health • Promote Economic Vitality • Protect and Promote Quality of Life			
Strategic Goals	**STRATEGIC GOAL 1.** Provide sustainable development and integrated management of the Nation's water resources.	**STRATEGIC GOAL 2.** Repair past environmental degradation and prevent future environmental losses.	**STRATEGIC GOAL 3.** Ensure that projects perform in a manner to meet authorized purposes and evolving conditions.	**STRATEGIC GOAL 4.** Reduce vulnerabilities and losses to the Nation and the Army from natural and man-made disasters, including terrorism.
Strategic Objectives and Business Program Goals	**STRATEGIC OBJECTIVE 1.1**. Seek water resources solutions that better balance economic, environmental, and quality of life goals. Program Goals: **Navigation:** Invest in navigation infrastructure that is fully capable of supporting national maritime requirements in environmentally sustainable ways. **Flood and Coastal Storm Damage Reduction:** Invest in solutions that meet criteria for Federal participation and that reduce the Nation's flood losses in environmentally sustainable ways. STRATEGIC OBJECTIVE 1.2. **Support the formulation of regional and watershed solutions to water resources problems.** Program Goal: Move the **Civil Works Program** in the direction of greater integration of activities on a watershed basis.	**STRATEGIC OBJECTIVE 2.1**. Identify and restore ecosystems degraded by past development. Program Goal: **EnvironmentalRestoration and Mitigation:** Remediate and restore the Nation's water and land resources within watersheds and coastal zones using an analytic framework that balances human needs with those of nature. **STRATEGIC OBJECTIVE 2.2.** Assure zero net-loss of wetlands. Program Goals: **Regulatory:** Provide for efficient decision making in issuing permits. Protect the aquatic environment to assure no net loss of wetlands from private and public development activity. **STRATEGIC OBJECTIVE 2.3.** Assist other agencies in the cleanup of contaminated hazardous, toxic, and radioactive (HTRW) sites as authorized to the best of our capabilities.	**STRATEGIC OBJECTIVE 3.1.** Improve the efficiency of existing Corps water resources projects. **STRATEGIC OBJECTIVE 3.2.** Improve the effectiveness of existing Corps water resources projects in adaptive ways. Program Goals: **Navigation:** Maintain a high degree of availability for high-use coastal harbors (deep draft and shallow draft) and inland waterways systems to achieve their committed level of service. **Flood and Coastal Storm Damage Reduction:** Operate and maintain Corps facilities to provide the design level of flood damage reduction. **Environmental Stewardship:** Manage, conserve, and protect the natural and cultural resources at Corps water resources projects, consistent with ecosystem management principles, to serve the needs of present and future generations.	**STRATEGIC OBJECTIVE 4.1.** Prepare and provide for rapid, efficient, and effective all-hazards response and recovery. Program Goals: **Emergency Management:** Attain and maintain a high, consistent state of preparedness. Provide rapid, effective, efficient all-hazards response. Ensure effective and efficient long-term recovery with emphasis on the Nation's water resources infrastructure **STRATEGIC OBJECTIVE 4.2.** Improve and maintain the safety and security of critical infrastructure. Program Goal: **Emergency Management:** Reduce risks to critical water resources infrastructure. STRATEGIC OBJECTIVE 4.3. Leverage Civil Works assets to support the Army and strengthen homeland security.

Strategic Goals	**STRATEGIC GOAL 1.** Provide sustainable development and integrated management of the Nation's water resources.	**STRATEGIC GOAL 2.** Repair past environmental degradation and prevent future environmental losses.	**STRATEGIC GOAL 3.** Ensure that projects perform in a manner to meet authorized purposes and evolving conditions.	**STRATEGIC GOAL 4.** Reduce vulnerabilities and losses to the Nation and the Army from natural and man-made disasters, including terrorism.
Strategic Objectives and Business Program Goals		Program Goal: **FUSRAP:** Assist others in sustaining and enhancing the Nation's environmental resource base.	**Hydropower:** Maintain a high degree of hydroelectric generation unit availability at Corps multi-purpose projects. **Recreation:** Provide outdoor recreation opportunities in an effective and efficient manner. Provide continued outdoor recreation opportunities to meet the needs of present and future generations. Provide a safe and healthful outdoor recreation environment for customers and the Corps workforce.	Program Goals: **Homeland Security:** Define and strengthen the relationship between the U.S. Army Corps of Engineers and the Office of Homeland Security and future Department of Homeland Security. Align the capabilities within the Corps to respond to homeland security requirements as they are specified by responsible military and civil authorities.
Organizational Goal and Objectives	**STRATEGIC GOAL 5.** Be a world-class public engineering organization (incorporates the **President's Management Initiatives)** STRATEGIC OBJECTIVE 5.1. Be a world-class technical leader. • Develop a **Human Capital Strategy** to recruit, maintain, and enhance technical capability in core competencies. • Compete out functions and positions that are not inherently governmental (i.e., reviewable positions) without denigrating mission accomplishment in core technical capabilities. **(Competitive Sourcing)** STRATEGIC OBJECTIVE 5.2. **Improve financial performance.** • Produce an auditable annual Civil Works financial statement. • **Integrate performance and budgeting.** STRATEGIC OBJECTIVE 5.3. **Become a more citizen-centered, effective, and efficient organization.** • Develop a Capital Planning and Investment Control Plan. • Develop a Corps of Engineers Enterprise Architecture. • Develop business cases for major investments. • Develop a plan for e-government initiatives.			

VI. Implementation

The five Civil Works Program Strategic Goals support both the Civil Works Program vision and the corporate vision for the total Corps of Engineers to be the world's premier public engineering organization responding to our Nation's needs in peace and war. The Civil Works Strategic Goals provide the broad direction for specific Civil Works Business Programs in the form of performance goals, measures, and performance targets as presented in the Annual Performance Plan. Figure 6 portrays the relationship among these elements.

The Chief of Engineers desires the Corps to become a learning organization through integration of initiatives devoted to people, process, and strategic communications. The Project Management Business Process is the integrating mechanism. By becoming a learning organization, the Corps will be able to improve its strategic, tactical, and operational capabilities in ways that respond to environmental demands. Feedback about individual, team, and organizational performance at the project, District, Division, regional, and national levels becomes an essential component to becoming an effective learning organization. This strategic plan aims to provide both direction and sources of feedback to keep the Army Corps of Engineers on its azimuth toward continued improvement. An ongoing dialogue with our field organization and our partners, stakeholders, local sponsors, and others concerned about the Nation's water resources will lead us toward the improvements that we seek for the benefit of those whom we serve.

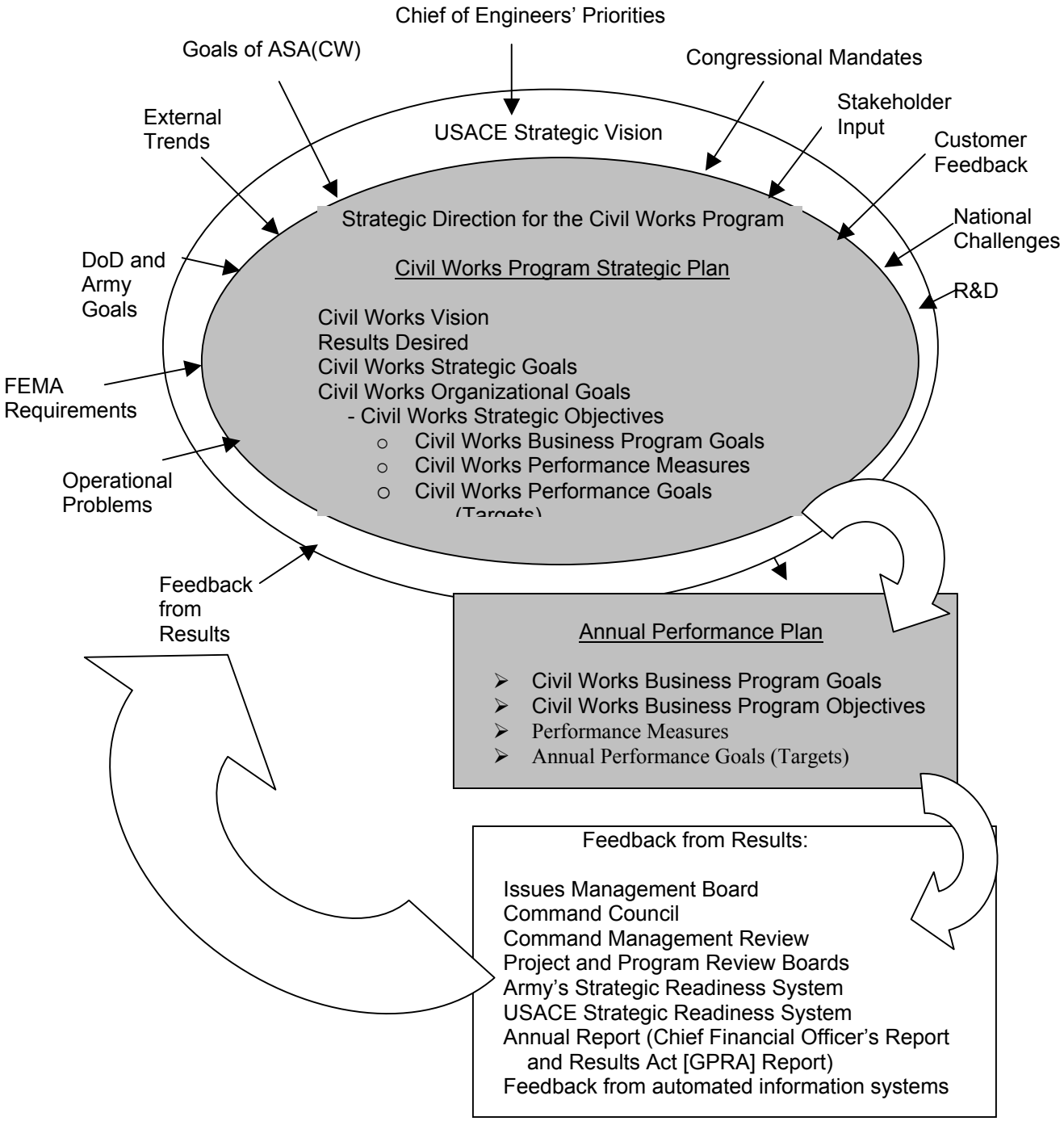

Figure 6. Strategic Planning Process

Evaluation and Update

This strategic plan is a living document that will continue to evolve and be updated. Several mechanisms examine program results. The success of the Civil Works Program is reviewed through command inspections and forums for project and program reviews. These are described in the **Consolidated Command Guidance** (CCG) issued prior to the start of each fiscal year.

- At the Division or Major Subordinate Command (MSC) level, **Campaign Plans** are developed to shape regional priorities based on the Strategic Vision and USACE Strategic Readiness System as communicated through the Consolidated Command Guidance and Program Plans. The MSC **Regional Management Boards** (RMBs) meet to allocate funds for program execution and conduct programmatic reviews. The RMB aims to improve the distribution of resources to meet both division and district requirements. In addition, periodic reviews are conducted to review and revise Campaign Plans.

- At the Headquarters level, the Civil Works Directorate conducts quarterly program reviews for the Civil Works program as a whole in the form of a **Program Review Board.** This review anticipates requirements and guides issues about total program execution. The corporate review of all programs and other Corps-wide initiatives is conducted in the quarterly **Command Management Review.** Strategic Management Reviews will be conducted in concert with the Army's Strategic Readiness System and the **USACE Strategic Readiness System**, a balanced scorecard approach to identifying critical performance measures and standards. Measures are currently being developed for the five core USACE competencies. The standards are reinforced through the **Command Inspection Program.**

- The worthiness of the Strategic Plan is also evaluated through **feedback** on the water resources solutions generated through the project planning and evaluation process and from feedback from our customers.

In addition to internal evaluations and updates, the strategic plan will be updated periodically as the need arises given key organizational and personnel changes and in consonance with the timelines established by the Government Performance and Results Act of 1993.